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AGRICULTURE, SHIKAR & TRAVEL.

EDITED BY

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FOREST TREATMENT IN SOUTH TINNEVELLY.

Tinnevelly forms the southernmost district of the Madras Presidency and occupies an area of 5381 square miles. Its principal forest areas occupy the eastern slopes of the range of hills which forms the western boundary of the district and is roughly taken at 900,000 acres. The mean annual rainfall in the plains may be estimated at 30, and that on the hills at 100 inches. Deciduous forests occupy all the drier slopes up to an elevation of 2,000 feet and from this elevation great masses of evergreen forests, broken only by ruined patches of Karni clearings, stretch themselves upward to the crests of the range and along the streams at the bottom of valleys. A line of cairns which runs more or less midway along the slopes, separates the "Reserved Lands," which lie below, from the "Reserved Forests" which lie above it. In the former, free grazing and the removal of headloads of grass and firewood for *bonâ fide* home use are allowed; but in the latter no such privileges exist.

South Tinnevelly comprises the taluqs of Nanguneri, and Ambasamudram; but my remarks will chiefly apply to Papanasam which is by far the principal block in the district. The forest area, although very limited and the field for work not large, has, still, much in it that is interesting The sacred waters of the Tambaraparni and other rivers take their rise here, and it is the irrigation they afford which is the principal source of wealth to the district; fairly good fishing and shooting are obtained, and the richness and variety of the vegetation are well known.

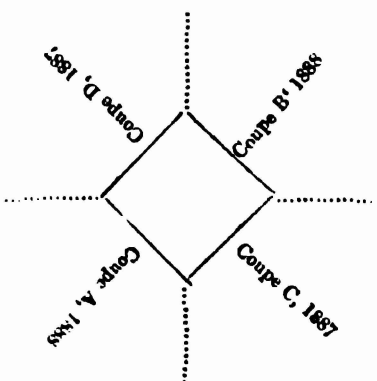
The forests were formerly worked under the "License" and "Selection" systems and more recently "Coppice under standards," "Jardinage," and cultural operations were introduced.

LICENSE SYSTEM:—This was applied to the lower deciduous forests and was confined to the removal of firewood, agricultural implements and small timber. It may be briefly described as follows. The *purchaser* on payment of a fee receives from the *issuer* a ticket which prescribes the period and locality, the description and amount of produce, and the thanna through which the

produce must pass. At the thanna the produce is checked and if it accords with the terms of the ticket, the ticket is retained and in exchange a "way permit" is given, which covers the produce to its place of destination. It will be at once seen that this is a wasteful and ruinous system. Under it the best trees are selected and removed and crooked, gnarled, dwarfed and rejected trees remain which must only deteriorate the forests and reduce their value and utility; or perhaps out of a felled tree a small portion of the trunk or a branch is taken and the rest allowed to rot or removed for some other less useful purpose. This system has given way to the "Coppice under standards" system.

COPPICE UNDER STANDARDS:—An attempt at this system was made the year previous on small irregular patches, but it was not understood and it proved a financial failure.

The Mundanthorai plateau, which is about 10 square miles, was then chosen, as it is centrally situated and affords easy access to the foresters and forest guards of the range for studying the system and applying it to their own charges. A base line was first laid out along the Mundanthorai-Kariar Road and from this parallel lines were taken 15 chains apart, then across these, at right-angles, another row of lines were cut at 20 chains apart, thereby dividing up the area into 30 acre coupes so arranged that the winds which blow with great force for nearly four months in the year cut the coupes more or less at right-angles to their greater length. The coupes are demarcated with stones, showing the number or name of the coupe and the year in which the coupe was felled, thus:—



(The angle of the stones shows the direction of the coupe boundary line, and each face of the stone points to the cut area and has inscribed on it the name of the coupe and the year in which it was cut.)

The principal trees and shrubs found within the plateau are Teak, Pterocarpus Marsupium, Satinwood, Tamarind, Grewia tiliæfolia, abutilifolia and asiatica, Briedelia retusa, Cordia Myxa and angustifolia, Cassia Fistula, Albozzia odoratissima, Lebbek and amara, Spondias mangifera, Hemigyrosa canescens and deficiens, Schleichera trijuga, Diospyros Embryopteris and Melanoxylon, Careya arborea, Zizyphus Jujuba and xylopyra, Anogeissus latifolia, Dalbergia latifolia, paniculata and lanceolaria, Premna latifolia, Morinda citrifolia, Chionanthus malabarica, Sapindus emarginatus, Walsura piscidia, Aglaia, minutiflora, Atalantia monophylla, Limonia alata, Mundulea suberosa, Buchanania latifolia, Terminalia Chebula, Arjuna and belerica, Vitex altissima and trifolia, Mimusops indica and Roxburghiana, Cycas revoluta, Gyrocarpus Jacquini, Givotia rottleriformis, Bauhinia malabarica and tomentosa, Hydnocarpus alpina, Hardwickia binata and pinnata, Phyllanthus Emblica and polyphyllus, with dense extensive patches of undergrowth consisting mostly of Strobilanthes Kunthianus, Memecylon tinctorium, Randia dumetorum, Webera asiatica, Flacourtia sepiaria, Erythroxylon indicum, Dichrostachys cinerea, Zizyphus Œnoplia, Helicteres Isora, Actephila excelsa and Cadaba triphylla.

Most of the trees and shrubs coppice well and send out strong, vigorous shoots, and in the case of Dalbergia paniculata it was here discovered, as was noticed in the 1888 September number of the *Indian Forester*, that coppice shoots spring from the parenchyma between the woody zones, a fact unknown in other dicotyledonous plants.

I am indebted to J. G. F. M. for his "A note on Forest Management in Tinnevelly" published in the January-March number of the *Indian Forester* where he has given in much detail the "signal advantages" gained by the system, but a short account from one who had introduced the system and laid out the coupes, may not be out of place.

The fellings were done departmentally, but might now be given out on contract, except for the fact that small branches and twigs are removed in headloads by the poorer class of villagers, mostly women, from the sale of which they just scrape a day's living. It would be exceedingly hard to leave them to the tender mercies of a contractor. I have not an account of the out-turn of produce with me, but the net gain at the end of the official year 1888-89 was something near Rs. 25 per acre, with a prospect of being very materially increased.

From 10 to 20 standards, according to the richness or poorness of the soil and the denseness of the undergrowth, were left per acre. On fairly extensive slopes of 1 in 10 and steeper, it was found advisable to retain the continuity of the leaf canopy and the fellings approached more an improvement—thinning and cleaning operation than regular coppice; care being taken to improve the stock, prevent erosion and maintain high forest. The regrowth

from stools and the reproduction from self-sown seed were very good, owing of course to the greater amount and better quality of seeds produced by the parent trees, caused by the admission of more light all around them and by the breaking of the surface and the lodgement of the seed direct into the mineral soil by the felling, conversion and transport operations.

The average height of the teak shoots for the first year was 5 feet and the girth 2·5 inches. For the other species it was somewhat less.

The only dangers to be encountered are from the winds which blow with great force for nearly four months in the year; from the Sambur and from insects. The effect of wind is mitigated by cutting the coupes as is now done in alternate strips. The Sambur selects the soft corky bark of the *Mundulea Suberosa* and of satinwood saplings for rubbing his horns against, and those saplings thus attacked are generally very much damaged and eventually produce heartshakes which, in the case of satinwood, unfit it for the naves of wheels for which it is much used and especially valued. The trees may be protected by fencing them round with, or hanging round their bark from 2 to 4 feet high Prickly Pear or any other thorny shrub.

Coppice under standards is now introduced throughout the district with very good results, both financially and as a means of improving and regenerating the low deciduous forests. With the data now at hand a working plan might easily be drawn up and strictly adhered to.

The Tinnevelly "*Selection System*" much resembled License system in that it allowed the Contractor to pick and its choose the trees for felling over an extensive area and resulted in the dead, dying, hollow, and stag-headed trees, being left behind. This method has since given place to "Jardinage" or the "selection method" properly understood.

Jardinage:—This method is applied to the evergreen forests or "Sholas" and to trees of special value in the upper deciduous and semi-evergreen forests. The Sholas require most careful treatment as on their existence depends the continuance of the water-supply to the rivers and streams. We have just begun to mark out coupes and to work them systematically and with a view to the above purpose (namely, the insurance of the water-supply to the rivers and streams). The points in view were:—

(1.) *The continuity of the leaf canopy.* Just ripe, over-ripe and dying trees were removed at the rate of one tree per two acres.

(2.) *The improvement of individual trees* by cutting away from them the creepers and Loranthus.

(3.) *The germination of seeds of the more important species*, such as Kongu, which was assisted by cutting away the brushwood and raking up the ground immediately after a goodly

number of seeds had fallen; *and fostering of seedlings and saplings* by cleanings and the removal of cover so that they might eventually take the place of the fallen veterans.

In the abandoned Karni clearings, seedlings of the principal indigenous species were planted out and are mentioned under cultural operations.

Of the principal shola trees I may mention Hopea Wightiana (Vella Kongu), which is par excellence the timber of Tinnevelly, Balanocarpus utile (Karun Kongu), Aglaia Roxburghiana (Chockla), Gluta travancorica (Shenkurani), Cullenia excelsa (Vedipela), Bassia latifolia (Malai Ilupai), Hardwickia pinnata (Yanai Kolavu) Pterospermum rubiginosum (Sitalapolavu), Heritiera Papilio (Santhana Unnu), Cedrela Toona (Mathacaree Vembu), Diospyros calycina (Thovara), D. Ebenum (Karuthali), Myristica laurifolia (Katujadica), M. corticosa (Kakamungi), Alstonia scholaris (Thundapalai), Vitex altissima (Milay), Bischoffia javanica (Mala Chadiyan), Mesua ferrea (Nangu), Litsœa zeylanica (Shembugapala), Acrocarpus fraxinifolius (Mala Kounai), Euphoria Longana (Puvan) and Filicium decipiens.

Notes on the out-turn from conversion, and the reducing factors of some of the principal Classes of trees were taken, but are mislaid. I shall try to supply them later on.

CULTURAL OPERATIONS:—These were formerly confined to grassy areas through which narrow parallel lines were cut and teak and vengai (Pterocarpus Marsupium) seeds were dibbled in. It was always so far as I am aware, a failure.

Considering the importance of the evergreen forests both as a means of insuring the water-supply of the Tambaraparni and other rivers and financially from the large revenue obtained from them, it had always occured to me to extend these forests which already have been very much contracted by the unlimited Karni or Kumri clearings, which are now for the most part abandoned and consist of low, dense, tangled, shrubby growth. With this view, permanent nurseries were made at Kannikally Odei and Ullaar and seedlings of the principal species such as Kongu, Satinwood, &c., were raised in them and put out on the abandoned Karni clearings (sites of Sholas cleared for cultivation) in parallel contour lines during the first burst of the North East and South West monsoons in the form of an *introduction*. Teak and Vengai (trees of deciduous forests) were put out into the more open places, and black and white Kongu, Nangu and other "Shade loving" species into shady places. Seeds also were dibbled in, but this was chiefly done by the Watchers and Forest Guards who carried seeds in their waist cloths and dibbled them in, in their beats, during the rains, in exposed and burnt up places.

It may be mentioned that the areas were first cleared of all creepers and tangled growth and that the introduced plants were freed from vertical covering and wherever self-sown seedlings and saplings of the principal species were found it was merely cleaned

around them so as to protected them against suppression.

In addition to the plants obtained from the nurseries I was able to obtain 1,000 Checkla, 2,000 Nangu, and 2,000 Kongu seedlings from self-sown seeds in the forests. These were taken out and planted in November, 1888.

I had just six months to watch the results of these operations which extended over an area of 50 acres, but during that time I noticed that the majority of the plants were established and doing well. It will of course be necessary to replant failures and to clean the areas occasionally.

S. C. MOSS.

THE EXTERMINATION OF WILD BEASTS IN THE CENTRAL PROVINCES.

From time to time a statement appears in the Indian papers showing the number of persons that have been killed by wild beasts and by snakebite during some preceding period of twelve months. This number, if we remember rightly, generally remains fairly constant at some 20,000 head. And English papers get hold of these figures and taking them in good faith, publish heart-rending articles on this terrible mortality. But there is good reason to believe that the number of deaths from snakebite at least is not to be relied on, as many deaths, such as those from heart disease, or in some cases from poisoning, are attributed to that cause. Still, when all allowances are made for error, the number remains sufficiently large.

A recent Resolution published by the Chief Commissioner of the Central Provinces dwells on this subject at some length. It appears that in 1890, the number of persons killed by wild animals in the C. P. was 368, and the number of deaths said to be due to snakebite was 1041, the total loss of human life being 14 more than in 1889.

The ravages due to wolves in the Hoshangabad, Saugor, and Narsinghpur districts, and the measures successfully adopted for the destruction of these pests have already been described in some of the Indian papers. It will suffice it to say here that 87 deaths were due to this cause and that the pack has been entirely exterminated, owing to the systematic arrangements of the special officer deputed for that purpose.

Various man-eating tigers have been destroyed : one in the Raipur district for which a reward of Rs. 300 was offered ; another in Bhandara ; besides several in Hoshangabad, Chanda, Balaghat, and Seoni. In all, about seven or eight man-eaters have been satisfactorily accounted for. Panthers claim 26 victims.

The number of cattle reported to have been killed by wild beasts is 4620 against 3390 in 1889. These figures however do not pretend to accuracy, as a change has been made in the manner of preparing the returns, and cattle which have strayed and have then been stolen are often reported as carried off by wild beasts. It is believed that wild dogs in some districts have destroyed a good many cattle.

The number of gun licenses in operation was 13,426, a large increase on the figures for 1889; and the Commissioner of the Nerbudda Division observes that there is no lack of arms, but rather of efficient Shikaris.

The next part of the Resolution deals with two suggestions made by the Government of India the first of which relates to rewards. "The scale of ordinary rewards now in force in the 'Central Provinces for the destruction of wild animals is as 'follows :—

'For tigers	..	...	Rs. 50
„ do. cubs	...	...	„ 20
„ man-eating tigers	...	...	„ 100
„ panthers and leopards	...	...	„ 10
„ do. do. cubs	...	...	„ 5
„ bears	...	...	„ 5
„ do. cubs	...	...	„ 2
„ wolves	...	...	„ 2
„ any wolf, haunting villages and seizing children			„ 5
„ wolf cubs	...	...	As. 8
„ hyenas	...	...	Rs. 5
„ do. cubs	...	...	As. 8

"In the case of man-eating panthers and wolves, and of man-'eating tigers, for the destruction of which the ordinary reward of 'Rs. 100 is found insufficient, special rewards are sanctioned, as 'occasion requires, and these have sometimes been as much as 'Rs. 500. The general opinion is that in most respects this scale 'is sufficiently liberal, and the Chief Commissioner would prefer 'not to alter it at present or until he has had further experience of 'its operation."

The rewards are paid either by the Deputy Commissioner, in the case of animals for which special rewards have been sanctioned, and also in the case of wolves and wolf cubs; or at the nearest Tahsili or Police Station. The skins are sent in to head quarters along with the bill "to prevent fraud," and of course the shikari never sees his skin again. In some provinces we believe the custom is to mark the skin in such a manner as to prevent its being brought up a second time, and then to return it to the owner. The Deputy Commissioner had to inspect the skins of wolves himself owing to frauds perpetrated by the passing off of jackal skins instead of the real article.

The second suggestion made by the Government of India is so interesting to us as Foresters, that we do not apologize for

quoting what the Resolution says about it at length. The suggestion is that "shooting parties should be encouraged for the destruction of tigers and other dangerous carnivora in reserved forests, and that in addition to liberal rewards, assistance in the way of elephants should be freely given to Military officers and others who have leisure to organize shooting-parties for the destruction of advertised man-eaters. In connection with the general subject of Forest administration, the Chief Commissioner has recently had occasion to consider the Forest Shooting Rules in force in these Provinces. These rules were first officially published in November 1888. They were subsequently modified, and in these Rules no person other than Forest officers or Military officers below the rank of Field Officer may shoot in a reserved forest at any time without a permit, for which* a fee is charged; while in closed or fire-protected forests, no shooting is allowed between the 1st January and 30th June. Practically the effect of the Rules should be to close the Government Forests, which cover something over 20,000 square miles of country, to Native Shikaris—who, if inferior marksmen, are still our most efficient, because by far the most numerous agency for destroying wild animals; and to convert these forests —that is one-fourth of the entire khalsa area of the Province—into preserves for wild beasts. Enquiries have been made as to the effect of these Rules in increasing the number of wild animals: and from the information acquired, as well as from his perception of the bearing and tendency of the Rules themselves, the Chief Commissioner is satisfied that the Rules tend to protect, and as a matter of fact do protect, wild animals and augment their numbers. The Shooting Rules came into operation in November 1888: and since then there has been, as the figures in the margin show, a progressive and extraordinary decrease in the number of wild animals destroyed. This result is, in the opinion of some officers, chiefly produced by the prohibitive effect which the heavy license fees have on Native Shikaris who cannot afford to pay the fees, and to whom consequently the Government Forests are permanently closed. Other officers of sporting tastes, holding that Native Shikaris are inferior marksmen, view with satisfaction their exclusion from reserved forests, and think that this exclusion will result in fewer tigers being merely maimed and wounded, and through inability to catch their natural prey, becoming man-eaters. Other officers again who think that Native Shikaris never shoot tigers, but reserve themselves for deer and pig, find in these Rules an effective measure of protection for deer and pig, the legitimate

* Military officers below the rank of Field Officer are granted permits free of charge.

Year.	Wild animals killed.
1888 ...	1,825
1889 ...	1,223
1890 ...	1,000

'prey of the tiger, which being thus, it is presumed, provided with 'an abundance of food, has no need to turn man-eater. Finally, 'the Commissioner of a Division, a mighty hunter, ingeniously puts 'in a good word for the tigers: "If," he says, "tigers are all des- 'troyed, the damage which will then be caused (by deer and pig) 'to the crops in the villages lying in the vicinity of the forests 'will become a very serious matter, and be much more severely felt 'than the loss of a few cattle"! But against these sportsman- 'like and, therefore, seductive arguments, the Chief Commissioner's 'official judgment is proof. Indeed, he regards them as testimony 'to the protective effect of the Rules, and as pleas for preserving 'large game in the vast forests of the Central Provinces. But 'Mr. MacDonnell, having in mind the long tale of loss to life and 'property which the present and all previous reports disclose, thinks 'that our object should be to rid the Province of destructive wild 'animals, and in the pursuit of this object he finds it difficult to 'make a distinction between wild animals which are destructive to 'life and those which are merely destructive to crops. The present 'Shooting Rules were, it is understood, introduced primarily with 'the object of Forest conservancy, and there was the subsidiary 'object of preventing the extinction of some species of birds and 'animals. The preservation of destructive canivora was, the Chief 'Commissioner believes, neither desired nor contemplated. But 'the rules have had this unforeseen effect, while there is every 'reason to think that the requirements of Forest conservancy will 'be sufficiently met by less restrictive measures.

"In May last the Chief Commissioner had an opportunity of 'bringing the matter before a Conference of Forest and Executive 'officers assembled to consider certain questions of Forest 'administration. The Conference comprised among its members 'some of the best sportsmen and most accomplished naturalists in 'the Province, and the unanimous opinion of these officers was that 'the Shooting Rules needed amendment. An amended draft of 'the Rules was submitted for the Chief Commissioner's orders, 'and this draft he has since been carefully considering. There are 'certain points, particularly in connection with a close season for 'game birds and for some animals, on which Mr. MacDonnell has 'still some enquiries to make; but his disposition is to accept the 'chief provisions of the modified rules substantially as submitted to 'him. Broadly speaking, their effect will be to allow greater free- 'dom of the chase, unrestricted by fees; or even by license, except 'in those fire-protected or specially reserved forests in which for 'reasons of public utility it is essential to maintain the license 'system. Even here, provision will be made, whereby, subject to 'safe-guards in the interests of Forest protection, all carnivorous 'animals may be hunted down and killed. As stated by Colonel 'Bloomfield, Deputy Commissioner of Narsinghpur, himself a good 'sportsman (who has now, however, exchanged his hunting grounds 'in the Central Provinces for well-earned retirement in England,)

'the shooting in and general hustling of Government Reserved 'Forests will soon diminish the supply of large carnivora."

It is worth while pausing h re to consider the views of the district officers consulted. It is evident that Native Shikaris have not been able to pay the high fees demanded and that the number of wild animals killed has largely decreased in a period of three years, a decrease amounting to 45 per cent. Some officers think that there will be fewer man-eaters in the future, either because there will be fewer tigers maimed by inferior native marksmen or because there will be more deer and pig for the tigers to eat. Another officer is of opinion that if too many tigers are shot down, pig and deer will increase to such an alarming degree that the villagers' crops will suffer.

Whatever the ingenious reason set forth may be they one and all view with satisfaction the exclusion of the Native Shikari, and yet there is another way of looking at the question and it is simply this, the more the Native Shikari is kept out of the reserved forest the greater chance will the district officer and his friends have of adding to their bag when they themselves take the field. We are glad to see that "against these seductive 'arguments, the Chief Commissioner's Official judgment is proof," and that in future the forests not specially fire-protected will be thrown open to sportsman of any creed or colour. The question of Forest Conservancy and shooting rules, or game rules, is too long to discourse now, and we hope to take it up at some future time. It is quite clear that the stringent rules adopted a short time ago in the C. P. and now about to be relaxed, are contrary to the spirit of the age, and that some method of opening the forests to legitimate sport consistent with their preservation from fire must be the object sought for.

S.

FOREST SETTLEMENTS.

SIR,

Before reading the interesting and valuable article under the heading of 'Rights and Privileges' in the Indian Forester issue for August, an opportunity had been afforded me of studying various Proceedings of the Madras Board of Revenue (Forests) terminating with draft notifications constituting Reserves, and I was already much struck with the "cautious observance of legal details" in that Presidency as commented on by you, and the strict limitation of the Forest Settlement Officers' work within the powers vested in him by the Forest Act. A comparison of these settlements with those made during the last 12 years in Upper India is extremely instructive, it shows to what extent the settlements in the N.-W. P. are faulty and what errors should be avoided in future, at the same time causing regret for the unsatisfactory results

hitherto obtained. The reasons for these inferior results you have touched on in the editorial above referred to, but it is well worth while to recapitulate and emphasize here. They are as follows:—

i. The absence of an Easements Act preceding the Forest Act.

ii. The absence of Authoritative rules for the guidance of Forest Settlement Officers.

iii. The absence of Special Settlement Officers with a thorough knowledge of Forest law, the work being frequently entrusted to district officials in additon to their own duties, officials who are often influenced by administrative considerations.

The consequences of these omissions may be briefly stated to be:—

i. A misunderstanding of the nature of an easement and confused ideas with regard to privileges granted as a matter of policy.

ii. A misunderstanding of the legal status of the Forest Settlement Officer and of the power vested in him, with the result that both the Settlement Officer and the Appellate Court exceed their powers and become, as you say, judges of equity and not of Civil law.

iii. A want of thoroughness in working out the detail of the settlements, referable partly to lack of leisure and partly to failure to foresee the results of insufficient definition and exactness.

In the early days of Forest Settlements in parts of the N.-W. P. the procedure adopted by the Settlement officer was apparently to visit the villages interested, to enquire what advantages were gained by proximity to Government Waste or Forest lands; and, after granting a "parwana" ensuring the continuance of these advantages, to enter the same as *rights* in the settlement record. These rights were in every instance undefined and thus amply provided for the future wants of a non-existent population, for the fodder supply of imaginary herds, and for the construction and repair of the buildings of the future destined to accommodate the coming race. A sense of the illegality of this method of settlement and of the injustice of burdening state property with servitudes to the undue advantage of a few, added to a fear that an ever increasing demand for free produce might ultimately result in the destruction of the forest open to rights, induced in subsequent settlements a more rational procedure; but, improved as this procedure undoubtedly is, it still bears evidence of being based in the faulty system it replaces and is infinitely less advanced than an inspection of records shows to be the case with Forest Settlements in the Madras Presidency. Opinions may differ within certain limits as to what forms a prescriptive right: a Forest Settlement Officer may be ordered in addition to his other duties to submit a list of licenses essential to the welfare of the tenantry, or to carry out any other work outside his province as Settlement Officer; but, as the Act stands, he has no authority

to record rights without legal proof, no power to provide for the future increase of the dominant heritage by recording an increased easement, and should he record any established right without exactly defining it, his action is not only illegal, but a legacy of "harassing disputes" almost impossible of adjustment will be left to future generations. Further, neither the Forest Settlement Officer nor the Appellate Court have authority to specify the way in which the rights recorded should be administrated: on this subject the executive order of the Local Government is necessary; and finally, the Forest Settlement Officer goes beyond his powers and and acts in direct contravention to Government orders, when he directs that free grant of produce or the control of certain portions of State forests should be made over to public departments.

All these irregularities occur in these later settlements of these provinces, and although these show a marked improvement on the earlier provincial attempts, more especially as regards the definition of timber and grazing rights, yet there is much more improvement required in the future. As you justly remark, the recording of rights has nothing to do with such concessions as the Local Government may see fit to make. The question as to whether a right exists should be argued like any other claim in a Civil Court, a Court composed in this instance for convenience sake of officials specially empowered to try the cases, and it is the lamentable confusion which evidently existed in the minds of former Forest Officers as well as of Forest Settlement Officers that has caused the Settlement records in these Provinces to be submitted to Government with such an indiscriminate confusion of rights and privileges, that, to unravel it, a re-opening of the whole investigation would in some instances be necessary. We must hope that in future settlements the powers and duties of the Settlement Officer may be clearly defined, that a knowledge of forest law may be demanded of him, and that the records of his work may show nothing but procedure legally undertaken. Further, it should be insisted on that the list of proposed concessions should not be drawn up by the Settlement Officer as such, but be granted under separate executive orders of the Local Government; and that the Appellate Court should concern itself solely with appeals from the judgment of the Civil Court presided over by the Forest Settlement Officer, leaving administrative details to the chief district and forest officers under the direction of the Local Government. Until this policy is adopted, we cannot hope to arrive at the satisfactory results embodied in the Madras Settlement Reports and our work in that direction will be far from final.

There is another matter which may may be touched on here as important as the proper recording of rights and concessions. The fact that Protected Forests are "not any real class of Forest at all" has been entirely everlooked in the earlier Settlements in these Provinces, it has not been understood that

the object of Chapter IV. Act VII. 1878, is merely to protect certain areas until such time as it is determined what portion of the areas should be reserved and what portion abandoned. The Protected Forests of the N.-W. P. were taken up with the intention of permanent retention, they are demarcated permanently and treated in every way as Reserves save that adequate protection under Chapter IV. is impossible, for there can be no Settlement of a Protected forest, but merely an enquiry and record of rights a record which must include all rights claimed but which is even then in no way final or authoritative Hence, as clearly put by Baden Powell in his Forest Jurisprudence, no prosecution for infringement of rules made by the Local Government need stand in a Court of Law should the defendant plead a prescriptive right to his action, a claim which could not be decided by the court. The question of reserving the Protected Forests of the N.-W. P. is urgent, for their administration stands on no sound basis.

S. E-W.

FORESTS AND THE FAMINE CODE.

We see, in the newspapers, copy of the orders of the Government of India on the question of the utilization of forests in times of scarcity and we extract the following from them.

"The next subject dealt with in the Resolution of 1890 is 'that of the utilization of forests in times of scarcity. Rules proposed with this object have been submitted by the Governments 'of Madras, Bombay, and Bengal. The rules referred to will be 'found in Appendix A attached to this Resolution, and although 'the Government of India accept the rules drafted in each Province 'as sufficiently providing for the object in view in each case, they 'will be glad to receive a copy of the rules as finally revised or 'confirmed by the Governments of the Provinces above named, as 'well as of any rules of a similar character framed by the Governments of other Provinces from which no rules have been received. 'The Government of India desire that some rule or rules which 'will admit of forest-produce being utilized, where circumstances 'admit, as human food, should find a place in every Code."

The Rules of Appendix A referred to are also herewith given. No possible objection can be taken to the Madras simple rule. As the Collectors of Districts are practically the chief Forest Officers of their Districts and responsible for the management of the Forests under the advice and recommendations of the Conservator in general, and of the District Forest Officer in special matters there could be no necessity for anything more. So, too, we presume that no objection can be taken to the Bombay Rules.

But the Bengal Rules seem to us to be open to objection from a Departmental point of view, for we cannot imagine that

any Forest Officer would wish to put obstacles in the way of the use of edible forest produce in time of famine and think that the last line or two of Rule 0·3 might well have been omitted. The Forest subordinate staff is probably not immaculate, but there is no reason to suppose, we think, that it is worse than the Revenue, Police, Public Works, Salt or any other similar Agency; while to affirm that the Divisional Officer is responsible for his subordinates is to affirm what we presume is the case in all Departments of the State. A Collector is surely responsible for his Revenue Peons and the District Superintendant of Police for his Constables.

"Proposed rules regarding the utilization of forest produce as human food in times of scarcity.

'Madras.—In localities where forest produce is utilizable as human food, every facility should be afforded by the Forest Officers to persons seeking such food in forest reserves.

'Bombay:—When it appears to the Collector, in Districts where edible fruits and roots are plentiful in forest reserves, that the privileges of collection enjoyed by wild tribes and special classes should, owing to failure of crops, be temporarily extended to all classes, he may so extend them, reporting to the Commissioner and giving the necessary instructions to the Divisional Forest Officers.

'Bengal.—00. When any considerable Government forest of waste land exists in a tract affected by scarcity or famine, and such forest or waste land contains in the opinion of the Commissioner of the Division, an important supply of the forest produce utilizable as human food, and not available to the neighbouring population, it shall be the duty of the Commissioner to arrange for the temporary withdrawal of all restrictions tending to exclude persons in distress from the full benefit of the natural products of the forest or waste land.

'01. If such forest is in part or in whole reserved or protected forest, and subject to rules and regulations under the Forest Act which do not admit of the edible forest produce being utilized by the neighbouring population free of charge, and to the extent that the Commissioner may consider neccessary, they will apply by telegraph to the Local Government for permission to suspend for the time being, the operation of any such rule or regulation in so far as it may conflict with the objects in view:

'*Provided* that permission shall not be given in either of the above cases to kill any animal of which the destruction is prohibited by law throughout the year.

'*Provided* also that no such concession shall be held to permit any damage by fire or by a negligent or wasteful process of obtaining the produce sought after.

'02. When the Commissioner shall have obtained permission to open any such Government reserved or protected forest, not already available to the neighbouring population in this respect, for the unrestricted collection and removal of edible forest produce, he shall proclaim the nature of the concession in all the surrounding country, specifying the areas to which the concession applies and the kinds of produce which the people may temporarily collect and remove for their personal use. He shall, similarly, when there is no longer occasion, in his opinion, to continue the concession, proclaim with the same publicity its discontinuance from a date to be specified in the proclamation.

'03. The Divisional Forest Officer shall obey any order communicated to him by the Commissioner of the Division, through the Collector or Deputy Commissioner of the District, in relation to the use and management of Government forests under his charge in times of scarcity or famine; and shall be responsible for any unnecessary and vexatious interference on the part of his subordinate staff."

FOREST FIRES CAUSED BY SPARKS.

Sir

I read with interest in the "Forester" for September the article on forest fires being caused by sparks produced by stones striking against each other, and was glad to see that the possibility of forest fires commencing in this manner has been proved.

Some years ago, I was trying to impress a group of villagers with the fact that they lost more than they gained by firing the forests, and was met with the reply: "We never fire the forests, 'the fires are caused by bamboos rubbing against each other in 'the wind." Not being prepared to accept this statement, I proceeded to argue the point, and at last compelled my auditors to admit that the friction of bamboos was neither rapid nor regular enough to cause fire. An old shepherd then came to the fore and stated that cattle walking along steep slopes often dislodge stones which, rolling and bumping down the hills, strike sparks from other stones, and so set fire to the grass. Although this seemed quite possible, I found that the idea was rather scoffed at when I mentioned it to other officers, and so, like Brer Rabbit, I lay low; but now that the possibility of fires being caused is this manner has been proved, I mention my experience as it is probable that in order to ensure fire protection it might be necessary to prohibit grazing and felling on all slopes where quartz exists, during the fire season.

October, 1891. F. A. L.

FOREST FIRES IN FRANCE.

The *Revue des Eaux et Forêts* of September 10th gives some details of the result of forests fires in France. The worst of these fires were in the forests of the maritime pine in Gascony. The chief fire broke out on the 27th August at eleven o'clock in the morning, at a short distance from a place callad La Cantine. The flames, under the influence of the strong south-west wind that was blowing, entered the forest and by 2 o'clock in the afternoon the fire was raging over some 10 square kilometres (38 square miles) devastating parts of the communes of Saint Jean-d' Illac, Lanton, le Temple, Saint Médard-en-Jalles, and Martignas. In spite of the devoted efforts of the neighbouring population, the fire was only stopped at 11 o'clock in the evening and then only with the help of a torrent of rain which happily fell. No such disaster has occurred in Gascony in the memory of man. The damage done was enormous, and unhappily the losses were not confined to property only

A group of seven persons, four men, two women and a young girl of fourteen were trying to make a counter-fire, that is to set alight to a band of heath so as to make it burn to meet the fire.

The wind was from the south-west and suddenly a gust came and the flames they had just lit were turned against the unfortunate people who were enveloped in a huge whirlwind of smoke. They all threw themselves down with their faces in the sand and their hands over their mouths, but none rose again. Their bodies were discovered next day with the assistance of hounds, and were found to be completely carbonized. Besides these seven, three other victims were afterwards discovered to have been killed, as well as a number of cattle and sheep and curiously a large number of foxes.

Another fire broke out almost at the some time on the communal estate of Biscarosse and burnt all day before it could be extinquished, when it was found that about 7 square miles had been burnt. Other disastrous fires took place in the forests of the Esterel and in Corsica, as well as in Algeria in which country 83 square miles of forest were burnt over in August last all being the work of incendiaries.

LONDON RATE FOR PRODUCE.

(Tropical Agriculturist of October, 1891.)

Cardamoms Malabar	...	2s.	to	2s. 9d.	lb.
Croton seeds	...	15s.	to	20s.	cwt.
Cutch	...	24s.	to	32s. 6d.	,,
Gum Arabic, Madras	...	15s.	to	50s.	,,
Indian Rubber, Assam, best	...	1s. 6d.	to	1-11d.	lb.
Myrabolams, Bombay, best	...	13s.	to	18s.	cwt.
,, Jubbulpore, ,,	...	12-6	to	13 6	,,
,, Upper Godavery, best		11-6	to	12-6	,,
Nux Vomica, best	...	11s.	to	13-6	cwt.
Orchella, good	...	20s.	to	25s.	,,
Redwood	...	£3	to	£3-10	ton.
Sandalwood logs	...	£35	to	£60	,,
,, Chips	...	£9	to	£30	,,
Sapan wood	...	£4	to	£7	,,

II. SHIKAR, &c.

MY FIRST TIGER.

Your readers have probably seen this heading two or three times already, but as other peoples' first tigers were not related to my first tiger, it still possesses the charm of novelty, as far as I am concerned. The manner in which he was converted into an ornament for the drawing room was as follows. As I was opening my letters one morning, I come across a demi-official looking cover which contained a report of the death of a would-be shikari at the hands, or rather claws, of an infuriated tiger. Two native shikaris had spent a pleasant evening in a "machan" over a pool of water, and by the light of a waning moon had put a bullet into Mr. Stripes' shoulder; Stripes roared, the Shikaris shivered, and Stripes' mother came up to enquire into the cause of the bad language her son was using; when she saw him going on three legs, she used such fearful expressions that the "machan" shook with the agitation of the shikaris, unused as they were to anything stronger than the ordinary polite language of a native village. Mrs. Stripes helped her son back to the cover of the jungle, and silence reigned around the "machan" where the shikaris sat and shivered till sunrise, when, with rapid steps and many a glance over their shoulder, they made tracks for the nearest human habitation. There, about twenty men soon collected, and our shikaris, whose courage and imagination had been warmed by the sun, told their tale: the tiger was an enormous one, and the tigress still larger; their roars had shaken the hills; the tiger was mortally wounded and was certainly dead by this time; were they going to lose the sircar reward or were they going to show their courage by tracking a dead tiger and skinning him; and were they not twenty to one, and he a corpse! Armed with antiquated spears, guns more dangerous to the shooter than the shot at, billhooks and axes, they started in quest of the dead beast. Arrived at the "machan," their eagerness for the fray began to diminish, they spoke in whispers and kept sharp eyes on the surrounding jungle; but blood was plentiful on the track, and no tiger could lose so much blood and live, so their spirits rose and they followed the trail gaily for a mile and a half, by which time they had grown careless in the absolute certainty that they would find nothing but a lifeless mass at end. In this they, were mistaken, for with a sudden roar, a crash and a spring, Stripes stood among them; they scattered like mice before a cat,

but Stripes was two quick for one of them; he caught him by the waist and quietly carried him to the foot of a tree, among the upper branches of which two of the beaters had taken refuge; they were unarmed but yelled and shouted, and others in other trees did likewise, while some of the most distant slipped off their perches picked up their guns and fired them in the air. The general din had the desired effect; Stripes left his victim and slipped away to cover, where he was left in peace; the man was fearfully mauled, but still alive; his companions did what they could for him and carried him back to his village where he died an hour later.

My correspondent only gave me an outline of the story, and finished up with an appeal to me to send down somebody to shoot a man-eating tiger as nobody dared go into the jungle until he was accounted for.

I threw the letter across the table to M. who perused and returned it in silence: even when I asked him if he was "game," his only reply was a withering look and slight curl of his upper lip, so I said no more. It was three days before we could get away, but at last we found ourselves in a small inspection shed within a couple of miles of the ravine which had been the scene of the catastrophe already related. A consultation with some old native shikaris followed; how were we to get at Stripes, or obtain evidence of his death? No elephants were available, so we must walk, and walk circumspectly as the jungle was thick, and the tiger if alive was likely to be a dangerous customer. It would be useless driving cows in, for they would bolt at the first tigery sniff brought on the breeze; buffaloes would be better, but there were none in the adjoining villages; goats, said an old shikari, will do the trick; if the tiger is dead they will walk up to him and give tongue: if he is alive he will take one; the others will bolt, but we shall track him by the blood of the one he takes. Now, although I should have been exceedingly pleased if Stripes had been able and willing to slay ten thousand goats, I was loth to countenance the admission of those universal exterminators into a reserved forest, but without goats, not a man would come with us to show us the ravine, so reluctantly I gave orders for the goats to be brought and marched in. They behaved beautifully; walked along steadily, till we reached the entrance to the ravine; then spread out like a line of beaters and walked through the thick jungle; we had about a dozen native shikaris with us, and they showed no desire to lead the way; we visited the scene of the tragedy, found one shoe and a sanguinary cloth on the ground, and walked on for about 100 yards; we had come over a mile and a half with our rifles at full cock, and every nerve strained, through thick jungle in which a tiger might have lain within five yards of us without being seen, and had just emerged into more open ground when the goats stampeded; instantly a babel of voices broke out in the tops of the trees behind us, and looking

round, we discovered most of our shikaris well out of harm's way and looking anything but happy; two or three however stood their ground, and as soon as it was evident that Stripes was not following the goats, we walked cautiously round to where the stampede had commenced. Stripes heard us coming, and carried his goat off into a thicket before we could catch sight of him, but the fresh blood still sliding down the blades of grass showed that we were not far behind; we sat down and smoked a cigarette each, waiting for the other men to come up; then cautiously approached the thicket and walking along the edge tried to see into it. We had not gone twenty yards when we saw the dead goat about 20 feet from the edge; Stripes was invisible though he must have been sitting there while we were enjoying our smokes. A small "machan" was soon fixed up about fifteen yards from the kill, and ten feet from the ground, and there we took our seats with one native shikari, whose sharp eyes and ears we thought would be useful. For an hour and a half we sat there, and the discomfort was awful; first one leg went to sleep, and the least attempt to move it produced a variety of creaky noises; then the other leg followed suit; finally I felt that I must move, and slowly I leant back till my head rested against a leafy pillow. I woke up suddenly finding the shikari's hand on my shoulder; he was trembling from head to foot, and I was thankful that we had not allowed him to bring a gun with him; his eyes were nearly starting out of his head as he pointed with a drunkard's hand to a loophole on my left; I tried to rise silently but he signalled me back, and from the motion of his hand I understood that the tiger was walking round the machan on his way back to the goat; as soon as the shikari's hand showed that Stripes had his tail towards me, I raised myself slowly to a sitting posture; M. looked round and shook his head, then got his eye in a line with his sights again. A twig broke; then another; then a huge paw appeared under the brushwood six feet beyond the goat; then a whisker, a nose, another paw, and a head. Bang, bang, went our expresses, and a cloud of smoke shut out the view for what seemed half an hour, though really two seconds would have covered it. When the air cleared, stripes was lying "all of a heap" and the "coup de grace" which I intended for his head caught him in the shoulder which was about the only part of him visible. He took it very quietly; neither moved nor spoke; in spite of which we deemed it wise to take precautions, M. covering the carcase with his rifle while I descended to terra firma, when I did likewise for him; we approached cautiously, and heaved half a brick at his Majesty's nose; it caught him fair on the bridge, without producing any visible or audible effect on his temper. We had already signalled for the other shikaris, and as soon as they came up, stripes was dragged out and measured; seven feet nine inches from nose to tip of tail, and twenty one inches round his fore leg; he was hoisted on two poles and we started back for

camp. I almost forgot to add that he was not the wounded beast we were after, but we took it for granted that that one had died from the effects of his wounds. Now, will some old shikari tell me *how* to measure a tiger; should the tape be held taut, or made to follow every curve of the animal's back? My measurement was with the tape held taut; later on, after his skin had been removed and laid out, it measured ten feet six inches, and I then began to understood the possibility of twelve feet tigers.

TSEROFSKI.

ATHLETIC SPORTS AT THE DEHRA DUN FOREST SCHOOL.

The Annual Athletic Sports of the Forest School at Dehra Dún came off on the 7th November on the old Parade ground. There was a large attendance of Dehra Residents and of the friends of the students and the proceedings went off well, in spite of rather a hot midday sun. The following is the list of winners.

HURDLE RACE 120 yards; 1st, Firth; 2nd, Seager; 3rd, Walker.
100 YARDS RACE 1st, Seager; 2nd, Maung Henry; 3rd, Govinda Row.
230 YARDS RACE (*Native students only*), 1st, Maung Henry; 2nd, Ram Chandra; 3rd, Ethirajulu Naidu.
LONG JUMP (*Whole School*), Seager,
(*Natives only*), 1st, Uttam Singh; 2nd, Ethirajulu Naidu.
HIGH JUMP (*Whole School*) 1st, Maung Charley; 2nd, Walker.
THROWING THE CRICKET BALL (*Whole School*), 1st, C. Allen; 2nd, Seager.
(*Natives only.*) Ethirajulu Naidu.
PUTTING THE SHOT Walker.
PICK-A-BACK RACE. Seager and Mee.
TUG OF WAR. Senior Students.

There were also races for Goorkhas, Police and the School servants.

The prizes were kindly distributed by Mrs. W. H. Reynolds, who was accorded three willing cheers in thanks for her kindness in doing it.

The Sports were superintended by the School Staff with the valuable and kind assistance of Colonel Buller, the District Superintendent of Police, to whom, as well as to an old Student, Mr. W. Ferguson, Mr. Moir, Mr. Reynolds and others, thanks are due for their munificent subscriptions to the Fund. Our best thanks are also due to Mr. Ribbentrop, C. I. E., for his prize of a fine shikar knife to the best all round. It was won by Seager.

The Eardley-Wilmot Prize for a long distance race, will be run for in the Spring after the students have had the training of some months camp life and out-door work.

J. S. G.

VOLUNTEERING IN DEHRA DUN.

We are pleased to see that, from the accounts given in the papers, the Forest School Troop of the Dehra Dún Mounted Rifles acquitted itself very well at the inspection which came off on October 30th at their Camp on the Rispanna. In the absence of Lieut. Gilbert Rogers, Lieut. Smythies was in charge, and was ably assisted by Sergeants Thompson, Walker and Seager, the former of whom we regret to say had an accident in which he dislocated his shoulder. The cup presented by Capt. Armstrong was won by Trooper Martin (N.-W. Provinces Forest Department) as described in the following extract.—

"On Wednesday a competition was held for a cup presented by Captain 'Armstrong, under the following conditions: each competitor to have his horse 'picquetted 1,000 yards from the range, with saddle and bridle behind as on 'service; on the alarm being given each man to run in turn, fully armed and 'accoutred, saddle and bridle his horse, gallop across country to the shooting 'range over two fences and a water jump, dismount and fire five rounds at the '500 yards range at regulation targets, and five rounds at the 300 yards range, 'remount and gallop back to the starting point; shooting to be the first con-'sideration; saddling, time and style to come next. The cup was won by 'Trooper Martin of the Forest Division, who made an excellent score considering 'the difficult nature of the contest, and got full marks for saddlery and style; 'his time, eleven minutes, was beaten by several others, but their shooting was 'not so good. The many casualties at the water-jump showed how hard the 'course was."

In the shooting competitions, Prize No. I. 5 rounds at 200 yards and 5 at 300 yards, was won by Trooper Thompson (C. P.), Trooper Hearsey (Madras) being third. Prize No. II. 5 rounds at 500 yards and 5 rounds at 600 yards, was won by Trooper Lane-Ryan (Burma), Sergeant Walker (Ceylon) being third. For Prize No. III. 5 rounds at 700 yards and 5 at 800 yards, Troopers Knowles and Parsons were first and second. For Prize No. IV. rapid firing at 200 and 300 yards, Troopers Hearsey and Parsons tied for first place.

In the Volunteer Sports on the 31st the following Forest Members of the Corps were successful.

Postilion Race. 13 furlongs. 2nd, Trooper Anderson (C. P.)
Section competition. Sergt. Walker, Trooper Anderson, ties.
Lime cutting. Trooper Anderson first.
Tent pegging. Trooper Lane-Ryan second.

The Inspection went off very well. The inspecting Officer, Col. Handcock, expressed himself as very favourably impressed by the Corps; and after the dinner in the evening the prizes won at the sports and in the competitions, were distributed and the Burma Frontier Medal was presented to Trooper Lane-Ryan.

The corps now numbers 122 members. 72 in the Active troops and 50 in the Reserve. Every man in the Corps became efficient during the year and of the 72 men in the active troops 69 were extra efficient.

III. OFFICIAL PAPERS AND REVIEWS.

NEW REORGANIZATION SCHEME.

We have received Circular No. 18-F. of 29th July 1891, which contains the orders about this, and as most members of the Department will have seen it, it is unnecessary for us to review it in great detail. The main features are the division of the Controlling Staff into two sections 'Upper' and 'Lower.' The Upper Staff is again to be sub-divided into two sections: 'Imperial' recruited from England and 'Provincial' recruited in India, chiefly through Dehra Dún.

After this, the order is by no means clear, for the Upper Staff is again sub-divided into an 'Imperial List' and 'Provincial List,' the former containing the Inspector General, the Conservators, the Assistant Inspector General, and the Deputy Director and Instructors of the Forest School, with any officers that may be sent on Foreign service; and the latter containing the Deputy and Assistant Conservators and, we suppose, but it is not at all clear, the Extra Deputies.

Thus it will be seen that the Circular will probably require another to explain it and what with the distinctions between 'Imperial Staff' and 'Imperial List,' 'Provincial Staff' and 'Provincial List,' we should say that the Inspector General will have his work cut out for him to make everybody quite understand his position. A Deputy Conservator trained at Nancy and at present in charge of a Division is apparently on the 'Imperial Staff' but on the 'Provincial List' which is rather confusing. An Extra Deputy Conservator will apparently be on the 'Provincial Staff' and the 'Provincial List' but we may be mistaken.

However, this may be, there are to be 13 Conservators in the Bengal Presidency, three in Madras and two in Bombay (is the Sind appointment to be abolished, and if so why?)

Of Deputy Conservators we are not told (except the eleven first grade) how many there are to be in the Bengal Presidency, but Madras is to have twenty-one and Bombay twenty-two. So, too, Madras will have ten and Bombay seven Assistants, but we are not informed how many there are to be under the Government of India. Nor are we told how many Extra Deputies there are to be. In the Lower Controlling Staff, there are to be fifty-six Extra Assistant Conservators under the Government of India, eleven in Madras and nineteen in Bombay, making eighty-six in all.

For the benefit of outsiders, we give below the List of Classes and Grades with their rate of pay—

IMPERIAL STAFF.

CONSERVATOR OF FORESTS	1st grade	1,600
	2nd ,, ...	1,350
	3rd ,, ...	1,100
DEPUTY CONSERVATORS	1st ,, ...	900
	2nd ,, ...	800
	3rd ,, ...	650
	4th ,, ...	550
ASSISTANT CONSERVATORS	1st ,, ...	450
	2nd ,, ...	250

PROVINCIAL STAFF.

EXTRA DEPUTY CONSERVATORS	1st grade ...	600
	2nd ,, ...	550
	3rd ,, ...	500
	4th ,, ...	450
EXTRA ASSISTANT CONSERVATORS	1st ,, ...	350
	2nd ,, ...	300
	3rd ,, ...	250
	4th ,, ...	200

In conclusion, we can only express our regret that the Circular is not as clear as it ought to be—and our hope (a vain one, we fear) that it will succeed in satisfying everybody.

REVIEW OF FOREST ADMINISTRATION IN 1889-90.

We have just received this annual summary of the work of the Department by the Inspector General and propose to give a few extracts from it which we think will interest such of our readers as may not care to go through the whole of the original.

Mr. Ribbentrop has given this year, at the beginning, a useful summary of the year's work which we reproduce:

"The working of the Department during the year under 'review may be broadly summarized as follows:—The total area 'of forest estates under control was increased during the year by '4,254 square miles, of which 2,909 square miles are either Re- 'served or Protected forests The total area of forest lands on 'the books of the Department at the close of the year amounted 'to 105,445 square miles, and of this, 85,890 square miles are 'managed under Forest Acts or Regulations. Fire protection 'was successful over 22,244 square miles of forests, principally 'reserves, and an area of 49,253 acres was planted or sown with 'forest species. Rupees 2,83,829 were spent on buildings or lines 'of export for material in connection with the improvement of 'the forests. Timber and fuel, amounting to 153,168,882 cubic 'feet, were removed from the forests during the year. Minor 'produce of the gross value of Rs. 33,66,804 was also extracted.

'The gross revenue for the year amounted to Rs. 1,53,03,572, and 'the expenditure to Rs. 80,12,518. The surplus amounted to 'Rs. 72,91,054 as against Rs. 57,68,690, in the year 1888-89."

Under 'Alterations of Area' it is very properly remarked that true progress as regards area can only be measured by the additions to the Reserved Forests which alone can be regarded as permanent and regularly constituted forest estates. If the recently announced new policy is adopted, this increase should be larger in future years by the transfer to 'Reserved' of many of the forests now classed as 'Protected' or under other categories.

Under the head of 'Forest Settlements' is given such an important declaration of the Inspector General's views as regards the necessity for abandoning the system of doing forest settlements so much persisted in in some provinces, under which things which could not really be maintained at law are erected into permanent 'rights,' in favour of strictly legal methods of procedure. In our August number we drew attention to this subject in 'Rights and Privileges' and we are very glad indeed to find that so high an authority as Mr. Ribbentrop holds the same opinions as we there expressed. As we then said it is no more necessary to confer a right if you want to let a cultivator graze his cow in the forest, than it is necessary to burn down a whole house in order to roast a pig. We extract para 5 in full as we feel sure it is worthy of the widest publicity that can be given it, and we confidently look forward with hope that the Local Governments will adopt these views and let us have our settlement work done in legal fashion, by Forest Settlement Officers who understand that they are Civil Courts appointed to judge of law and not to adjudicate wholesale rights wherever they think they can trace a possible hardship. We fully acknowledge that hardships may exist and that privileges and concessions may have to be given, but it is the Government who should give them and not a Forest Settlement Officer, and the Government itself should only act with caution so as to save its successors from the difficulties which must arise in the future when things which seem so small and insignificant now and so easily given away have become important and valuable easements over the public estate.

" A satisfactory feature in the progress of Forest Administra-'tion is the constantly spreading recognition of the fact, that 'finality as regards the possession of forest property and the 'settlement of adverse rights is the necessary basis of sound forest 'management by the State; and that this finality can only be 'secured by the creation of Forest Reserves.

'Considerable progress has been made in this respect during 'the year under review, both in regard to the settlement of new 'areas and the conversion of Protected Forests into Reserves.

'In the Madras Presidency, Forest Settlements are considered 'in the light of purely judicial proceedings, and the Forest Settle-'ment Officers and Appellate Courts decide on the facts and

'proofs as they are brought before them. This procedure is 'unquestionably the intention and correct interpretation of the 'forest law, and doubtless yields the most stable and satisfactory 'results.

'In almost all other Provinces in which Forest Settlements 'are still in progress, the proceedings are to a greater or lesser 'degree, leavened, with administrative interference. This is 'defensible, and to some extent practical, in undeveloped forest 'countries, such as are found in the hilly parts of Burma, of Upper 'Assam, and in parts of Bengal, where Forest Settlements mean 'frequently nothing but the selection of the most suitable tracts 'for permanent forest reservation; but in cases where the State 'forest property is barely sufficient for the present and future 'requirements of the country, the strict legal settlement of the 'property and the adverse rights with which it may be burdened, 'is the only possible safeguard against future difficulties for which, 'should such arise, the present administration must be held res-'ponsible.

'The facts are not rarely lost sight of that the subsequent 'forest management is, on the one hand, frequently paralysed by 'the recognition of unproved privileges, and that, on the other, a 'strictly legal settlement does not preclude the forests being 'worked for the benefit of communities or persons unable to 'establish a right, but whom, for reasons of general administration 'it is desirable to favour. There are numerous historical prece-'dents regarding the danger of the forest capital, necessary for the 'future requirements and the development of a country, being 'sacrificed and consumed in order to make things smooth for the 'time being.

'In some Provinces, notably the Punjab, there has been an 'unexplained delay in notifying the results of Forest Settlements, 'which were practically completed several years ago. Such a 'policy of delay and abstention renders the management of the 'forests extremely difficult, and may lead to misunderstandings on 'the part of the right-holders with respect to future claims. In view 'of this necessity, the settlement should not be delayed or com-'plicated by administrative interference, which is strictly no part 'of the Settlement Officer's duty."

The next subject of importance which attracts our attention is that of Working Plans and we are glad that a definite opinion is given against the over elaboration of such schemes and that 'Working Plans of the simplest nature' are recommended. We should have liked, further, to have seen a more definite policy laid down on the subject of 'Working Plan Divisions' for we believe that such Divisions, only too often held by a quite junior and inexperienced officer, are a mistake, and that it is much better that the Plans for the forest should be made by the officer who knows them best. That officer is usually the Divisional Officer, who, after perhaps many years of experience, knowing

every part of his charge and its capabilities and requirements intimately, must be more competent to make its Working Plans than an officer who, however good himself, may never have been in that country before and has to spend (or waste) much preliminary time in learning all about it. Instead of having special Working Plans Officers, we would let Divisional Officers do the Plans and give them Assistants to help to carry on the ordinary work. This is being done now in France and was done most successfully in two special areas we lately visited, *viz:* the cork forests of the Esterel and the splendid forest of Fontainebleau. In both cases it was the Assistant Inspector who made the revised working plans, being given the assistance of a junior to help to perform the ordinary duties of his charge.

Fire-protection.—We have always thought that our statistics though perhaps as good as it is easy to make them, only imperfectly show the result of protection, because, if any real comparison is to be made between the results of protection in areas of such wide diversity of character and such wide difference of inflammability, co-efficients would have to be used. The proportion of failures to area attempted in 1889-90 was 10 per cent. It was, as might be expected, highest in Upper Burma, next in Assam, and we are surprised to see, next in the Punjab. We quote the Inspector General's remarks with the further opinion that possibly the results are due to the little interest taken in the work by others than Forest Officers and the idea that if a villager is not allowed to spoil his grazing ground by burning it, he is incurring a considerable hardship.

"*Punjab.*—In this Province special measures for the protec-
'tion of the forest from fire are more nominal than real, consisting
'for the most part in the retention of scattered fire guards whose
'beats are often of enormous extent. During the year under
'review, the result of fire-protection was more than usually dis-
'astrous as regards both the number and the extent of the areas
'burned. Of the specially protected areas nearly 60,000 acres,
'chiefly in the Hazara and Rawalpindi Divisions, were entered by
'fire, which also passed over more than 38,000 acres of forests, for
'the protection of which no special measures are taken. It is
'noticeable, too, that the cost of protection is continually increasing
'notwithstanding that the results are yearly less favourable. The
'Local Government expressed a willingness to consider special
'measures for the prevention of these fires, which periodically
'devastate the forests in the north-west portion of the Province.
'There can be little doubt that much remains to be done in the
'shape of fire-protection by fire-lines or otherwise.

On the *Grazing* question the Inspector General's remarks are interesting and worthy of being quoted. "The question of
'forest-grazing influences, on the one hand, forest management
'more intensely in India than in countries situated in temperate
'zones and, on the other, is of more vital importance to the

'population, who, even where no physical necessity exists for it, are 'wedded by custom and habits to a system of husbandry greatly 'dependent on large grazing areas. Thus the interests of agricul- 'ture and of State forest management appear to clash, especially 'in the drier regions of the Empire where long seasons of drought 'seem to prohibit a more advanced stage of agriculture than that 'which, as an inheritance of centuries, exists at present, but where 'at the same time the existence of forests and their maintenance 'is of special value not for the production of timber, but as a 'means for the storage of moisture.

'The question where and to what extent the administration 'should interfere with a long existing and gradually developed 'custom, is one of extreme difficulty, surrounded by many and 'varying side-issues, and dependent on local, climatic, physical 'and political conditions. It is impossible to lay down a general 'rule regarding the obligations of Government; and the action 'required and feasible must, in each case, depend on a local 'analysis of all circumstances.

'Experience has shown that such enquiries and subsequent 'action are, as a rule, most backward in those localities where State 'interference is most urgently called for. This is, to a certain 'extent, natural; for in such places drastic measures alone would be 'effective, and interference on the part of the Government would 'find the greatest opposition.

'Nevertheless, however disagreeable it may be to take the 'initiative and the responsibility of decided steps, it cannot be 'denied that the position does not improve by waiting, and that the 'measures as yet adopted are frequently inadequate to secure a 'thorough forest protection even of the catchment areas of the 'numerous streams rising in the lower hills and debouching into 'plains blessed with a naturally fruitful soil, which is sterile only 'on account of the want of a perennial water-supply. It is a well- 'known fact that extensive areas exist in India which were once 'fruitful and populated: and with the example of Ascension Island '(which was recently quoted in the *Indian Agriculturist*) before, 'us, it can hardly be doubted that they would become fruitful once 'more with a thorough afforestation of the lower hills on which they 'are dependent for their water-supply. At present such areas 'are increasing in extent. An intelligent and comprehensive exam- 'ination of the whole question, district by district, has recently 'been prescribed by the Government of India, and thus, it is hoped 'much additional light will be thrown on this difficult problem of 'administration. Managed on a sound system, the forest reserves 'will afford a much more secure supply of grass available in years 'of scarcity than would be provided if all grazing lands were 'without exception excluded from the reserved areas. This 'principle has been satisfactorily proved. Open grazing lands fail 'where they are most needed.

'The worst features of forest-grazing in many parts of India 'are the extent to which browsers, more especially goats, are 'admitted, and the wilful firing of forest areas open to grazing.'

There is not very much of importance recorded under *Natural Reproduction*. We agree fully in Mr. Ribbentrop's remarks on the best way to re-clothe the lower Punjab Hills:

"The object in the lower hills should be to cover the soil as 'quickly as possible, and to this end *Dodonæa viscosa*, owing to 'the facility with which it reproduces itself both from coppice and 'seed, is a valuable auxiliary species. Such growth will slowly be 'replaced by more valuable woods in course of time, provided that 'browsing and over-grazing be checked."

But we recommend fencing as the most valuable adjunct in places which it is desired to re-clothe. If grazing cannot be stopped over the whole, instead of fencing the whole, small portions can be fenced temporarily and 'crede experto' the results will usually be good. The statistics of areas under *Plantation* in the various Provinces do not seem to be very clear, but we notice the important fact that the area of toungya plantation, now practically pure teak forest, in Burma, exteuds now to 30 square miles, the cost of which is almost trifling.

Under *Financial Results* we note that the net Revenue in square mile of land under the control of the Department is highest in Lower Burma (Rs. 323), next in the N.-W. Provinces and Oudh (Rs. 198) the general average being Rs. 69. In France the net result of the working of the Government Forest comes to about 11 francs per hectare, or roughly Rs. 300 per square mile.

We will conclude by recapitulating the Financial results of the Department which were 153 lakhs Revenue against 80 lakhs expenditure, showing that the net revenue of the Forest Department, 73 lakhs, is by no means an inconsiderable addition to the financial resources of India. Were forest produce not so largely given away free but all taxed lightly as we think it ought to be to pay for cost of production and the maintenence of permanent supply, this amount would be very much greater still.

THE CULTIVATION OF RICE IN ITALY.

We have received Bulletin No. 21 of the Agricultural Department of Madras on the '*Cultivation of Rice in Italy*,' being extracts from an Italian official report translated by Mr. C. J. Peters, Executive Engineer, P. W. Department, S. Arcot.

We are told that the average area under rice in Italy is 498,463 acres, two-thirds of which is in the valley of the Po., and that the average outturn is nearly 40 bushels per acre, though the total production is steadily on the decrease. The following account of the history of rice cultivation is interesting.

History of rice cultivation.

" Rice (Oryza sativa of Linnæus) was supposed to come from Orissa, whence its name. The earliest mention of rice is found in the tragedies of Sophocles. It is supposed to have been introduced ' for the first time into Europe by the Greeks of Alexandria. It was ' an article of commerce from India when the Roman empire was ' at its zenith. Its cultivation was first introduced into Spain in ' the eighth century and into Italy in the tenth, but it was not cultivated largely until the fifteenth century, when the excavation of ' canals commenced. In 1523, it is recorded that the town and ' Marquis of Saluzzo suppressed rice cultivation in their territories ' owing to a pestilence which depopulated the town and country. ' From this time the Government began to make laws regulating ' the distribution of water and the distance of rice-fields from habi' tations. In 1595, the Venetian Republic ordered the destruction ' of all rice-fields established after 1556, seeing that their previous ' injunctions to restrict the cultivation had been disregarded. The ' Spanish and Milanese Governments continually issued proclama' tions, regulating the distance of rice-fields from habitations, re' markable for the extraordinary number of penalties, always ' threatened, hardly ever enacted. One of the most important ' proclamations is that of Governor Gusman Ponce de Leon of 7th ' November, 1662, fixing the distances from the principal centres of ' population under penalty of fines and corporal punishment at the ' discretion of the Governor.

" In spite of these restrictions, rice cultivation extended, ' favoured by the introduction of productive varieties and improved ' methods and the excavation of canals, until the opening of the ' Cavour system doubled the cultivation in Piedmont."

In the matter of the processes of cultivation there is not much to say, for they differ but little from those practised in India; but the cultivators in Italy are careful to establish a good rotation and grow as alternate crops oats, wheat clover, and meadow grasses, leaving the land fallow occasionally. The disease called 'brusone' which is a rust of the genus 'Pleospora' often does considerable damage if there is irregular weather in summer or where the soil is poor.

FORECAST OF THE WINTER RICE CROP.

The *Note on the preliminary forecast of winter rice* published by the Agricultural Department in Bengal gives the forecast of the crop as 13 annas, the average being 1 Rupee. And a similar result is expected from the *bhadoi* crops, except where locusts have done much damage, as they have done in Bhagulpore and the adjoining Districts.

IV.—TIMBER MARKET.

CHURCHILL AND SIM'S WOOD CIRCULAR.

EAST INDIA TEAK.—There has been a large consumption during September, though less than in the corresponding month last year, the figures being 1,551 loads, 2,040 loads and 345 loads for 1891, 1890, and 1889 respectively. For the first three quarters of this year there have been delivered from the Docks 11,392 loads, against 12,926 loads and 11,252 loads in the same period of the two preceding years. Statistics of the Timber shipping, and for shipment, are very eloquent against the prospect of excessive supplies, and holders becoming aware of this, are firm in their quotations. Some floating cargoes have been sold at an improvement, and any increase in the demand would establish the market at a higher level.

SATINWOOD *Logs* continue to be asked for and there is no stock; for *planks* and *boards* there is no demand.

ROSEWOOD.—East India. By some concessions in price important sales have been effected.

PRICES.

Indian Teak	...	per load, £ 8-10 to £ 14.
Malabar Cedar	...	per foot supl. 3½ d to 4 d.
Satinwood	..	per ton, £6 to £10.
Ebony	...	„ , £10 to £12.

N.-W. PROVINCES TIMBER RATES.

Statement of average selling rates for timber and bamboos in Meerut, Cawnpore, Bulandshahr, Pilibhit, Bareilly, and Moradabad for the quarter ending 30th September, 1891.

Description.	Timber Scantlings per score.		Bamboos per 100 scores.		Remarks.
	From	To	From	To	
MEERUT.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	
Sal 10′ Tors (Poles) ...	10 0 0	20 0 0	...	...	
Sal Karis, 12′ × 5″ × 4″ ..	25 0 0	40 0 0	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ...	7 8 0	12 10 0	...	...	
Bamboos of 9′ to 10′ per 100 score ..	...	...	25 0 0	80 0 0	
CAWNPORE.					
Sal 10′ Tors (Poles) ...	4 0 0	5 0 0	..	...	
Sal Sain Karris, 12′ × 5″ × 4″	8 0 0	10 0 0	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ...	2 8 0	3 0 0	...	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	20 0 0	30 0 0	
BULANDSHAHR.					
Sal 10′ Tors (Poles) ...	..	...	...	...	
Sal, Sian, &c., Karris, 12′ × 5″ × 4″ ...	...	...	...	...	
Sal bed posts 7′ × 2½″ × 2½″ ...	...	...	...	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	50 0 0	50 0 0	
PILIBHIT.					
Sal 10′ Tors (Poles) ...	40 0 0	70 0 0	...	...	
Sal Karris, 12′ × 5″ × 4″ ...	30 0 0	40 0 0	...	...	
Sal beds posts 7′ × 2½″ × 2½″ ...	5 0 0	6 4 0	..	..	
Bamboos of 9′ to 10′ per 100 score ...	...	...	60 0 0	100 0 0	
BAREILLY.					
Sal 10′ Scores (Poles) ...	5 0 0	10 0 0	...	...	
Sal Karris, 12′ × 5″ × 4″ {	50 0 0	60 0 0	...	...	
	25 0 0	40 0 0	...	...	
Sal bed posts 7′ × 2½″ × 2½″ ...	10 0 0	15 0 0	...	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	50 0 0	137 8 0	
MORADABAD.					
Sal 10′ Tors (Poles) ...	20 0 0	22 0 0	...	...	
Sal Sain, &c., Karris, 12′ × 5″ × 4″ ...	30 0 0	60 0 0	...	...	
Sal bed posts, ½′ × 2½″ × 2½″	10 0 0	12 8 0	...	...	
Bamboos of 9′ to 10′ per 100 score ...	..	...	50 0 0	100 0 0	

V. NOTES, QUERIES AND EXTRACTS.

DR H. NÖRDLINGER.

Dr. Hermann Nördlinger on retiring from his work as Professor at the University of Tübingen, has been decorated by the King of Wurtemberg with the order of the Crown. His name is familiar to our readers as the author, so to speak, of Nördlinger's sections of woods; but besides that, he has filled many posts, and has published many works, some in German, others in French. Among the latter are, *Note on the forest trees of Brittany*, Nantes, 1845; *Essay on the geology of the country round Grand-Jouan; Sixty transverse sections of the most common forest trees*, Nancy.

He also prepared a neat little box of 50 transverse sections of the more common Indian woods for the use of the students of the Dehra Dún Forest School, where it is on sale for Rs. 5.

TOURS OF THE COOPERS' HILL STUDENTS.

The forester students at Cooper's Hill paid a visit last July to some French forests in the neighbourhood of Bellême and Reno-Valdieu. It seems that there were 14 English students and two natives of India, the latter studying for service "under one of the Maharatta princes near Bombay." They were accompanied in their tour by Dr. Schlich and Mr. Fisher, and they received a cordial welcome from the French Forest Officers wherever they went. We hope the next time the Cooper's Hill students visit French forests, one of them will send us an account of the tour, as it could not fail to be interesting to many of our readers

DESTRUCTION OF TIGERS IN THE SUNDERBUNS FORESTS.

A Resolution of the Government of Bengal which appears in the Calcutta Gazette of October 7th has increased the reward for the destruction of tigers in the great Delta forests from Rs. 25 and 15 respectively for full grown animals and cubs, to Rs. 50 and 20. The new Rules provide as follows:—

The skin and skull of each tiger, tigress, or tiger-cub killed should be taken either to a Ranger or Forester in the Sunderbuns by whom they should be retained until the arrival of a gazetted officer of the Sunderbuns Forest Department, and produced before him for inspection, or to the District Magistrate, or, during

the absence of the latter from head-quarters, to the officer in charge of the district office, for inspection. The authorized rewards should be paid after the inspecting officer is thoroughly satisfied that the skin is intact and attached naturally to the skull, and that the animal was killed in the Sunderbuns protected or reserved forests. He should also personally see that the skull is destroyed so that it cannot possibly be used again.

THE HEAD OF THE CEYLON FOREST DEPARTMENT

We are given to understand that Government have at length come to terms with the present Deputy Conservator of Forests, Mr. A. F. Broun, with a view to securing his services permanently in the island. The exact terms of the agreement have not transpired, but Mr. Broun will shortly take entire control of the Department and will be entitled to pension as well. We are very pleased to hear this, because it is very important that this department should be placed in charge of a skilled and highly trained officer capable of working it up to be a real benefit to the community, and in course of time a source of income as well. Had Government allowed Mr. Broun to return to India, the Forest Department of Ceylon would have practically ceased to exist, and we congratulate Government on determining to take the wise step they have done.—*Ceylon Times.*

A BIG RAFT.

A raft containing upwards of three and a half millions of cubic feet of timber has been successfully towed by steam tugs from St. John, New Brunswick, to New York, and not a stick was lost during the voyage, which lasted sixteen days, the average rate of speed being two and a half miles per hour.

DESTRUCTION OF PRICKLY PEAR.

In Southern India the prickly-pear is largely used by the ryots for hedges, so much so that in many villages and even towns, the rapid extension of prickly-pear has become a crying evil with which it is impossible to deal adequately through the criminal law. The question of dealing with this mischievous and devastating growth and restraining it within reasonable bounds has long been engaging the attention of the authorities. Lately it was proposed by the Collector of Bellary to regard such cases in which prickly-pear spreads from a ryot's hedge over a neighbouring Government land as cases of "occupation" by the ryot, and charge them accordingly. He said it was difficult to see how a man can occupy land more completely than by allowing his "property" (to wit, the prickly-pear of the hedge) to spread over it in such a way as to make it useless or worse than useless to others. To support this view it was urged that a man, who merely enclosed

land for purposes of cultivation without patta is charged assessment, even though no cultivation may have actually taken place during the *fasli*. Similarly, also, waste lands used for straw-ricks or other purposes are charged, because if they were not so used they might be cultivated by somebody else. On this principle it was argued that land covered with prickly-pear through a ryot's neglect, should be regarded as a distinct occupation, and that if people *will* use such a plant as prickly-pear for their hedges, it was only right that they should be required to keep it under control. The Board of Revenue took a similar view of the case and relying on the decision of the High Court laying down the responsibility of a land holder for the over-growth of his hedge remarked that the law will support the claim of Government to consider such land as encroached upon and occupied by the owner of the hedge. "That it is encroached upon is evident; that this 'constitutes occupation is in accordance with Government rules; 'and that this occupation is directly by and at the hands of the 'owner of the hedge the law has laid down." The Government, however, is not prepared to go so far as the Board of Revenue and institute test cases, but it has requested the Board to report whether spreading of prickly-pear, croton, lantana, or any other noxious vegetation is becoming not merely a nuisance, but a serious public evil, and if so what special measures it would suggest to stop the increase of such vegetation.—*Indian Agriculturist.*

SERICULTURE IN ASSAM.

From the most ancient records available, we have abundant evidence that the rearing of silk-worms has formerly been carried on in almost the whole length and breadth of the Province. The food supplies of such species of worms as are only semi-domesticated are unlimited, and the climate, in most districts, is admirably suited for the growth of foods for the domesticated kinds of worms, as also for the wild worms themselves. At the present time the industry is carried on in a most desultory fashion, and the cultivation of that most appreciated, namely, the *Bombyx Mori*, is almost extinct. From cloths still obtainable, occasionally, the arts of both rearing and weaving must have attained a very high standard, but the *jogis*, or professional weavers, are daily getting fewer and fewer. Among the wealthier class of Assamese, *jogis* and descendants of original professionals, are still to be found working as common household menials, and only practising their calling occasionally, as the garments of the ladies of the household require renewing, or new garments are required for any forthcoming wedding. Till within the last 20 years, a system very analogous to slavery was in force in the province, and for a small advance of a few rupees, required perhaps to discharge a pressing claim, or a wedding-feast, a man and his family would enter into

bondage "*pur et simple*," his creditor master agreeing to allow him "*howlat*," *i. e.*, an advance of as many pice as he, the latter, might deem sufficient for any little extravagance, such as a new loin cloth, or an extra chittack of oil to rub over his body when musquitoes and flies are numerous, or for opium, and to supply him with rice and salt from the household stores. The bondsman's labour was debited against such advances, but all the rest that was supplied was credited with an accumulating interest beyond the man's power of arithmetically checking or disputing, so that the small original advance in the course of a few years hung not only over the parents, but on their progeny's grand-children. The introduction of tea-planting and the subsequent restrictions as to the length of period a contract to labor might be lawfully entered into, offered opportunities to many to obtain advances so as to release themselves from their former bond-holders, and it is probable that the bulk of the professional *jogis* have merged into agriculturists.

At the present day the largest quantity of silk produced in the province, is that called *Eria* or *Rhindi*, obtained from the *Attacus Ricini*, which is fed within doors on the castor-oil plant, *Ricinus Communis*. This plant grows in the villager's garden with hardly any care, but if the seed falls or is sown on the inevitable dung-heap it grows luxuriantly; so freely does it thrive, that the Assamese with their natural indolence, do not even take the trouble to select and sow those varieties of the plant whose leaves, from their enormous size, would supply food for four and five times the number of worms that they are at present able to rear. During the season, which lasts from the very beginning to the end of the rains and during which some seven crops of cocoons are reared, villagers having worms are frequently under the necessity of buying the leaves from their neighbours. When the worms have first emerged from the eggs, the tenderest and consequently the youngest leaves are necessary, and to assist their mastication, these are torn into shreds by the hand, lest the juices should be affected or deteriorated by any steel or iron knife, but when the worms have thrown off all but their last coat or skin, they will greedily devour mature leaves. From some superstitious idea, the droppings of the worms are daily thrown out on to the nearest road or pathway. For purposes of propagation, when the female moths emerge from the cocoon, they are placed in bundles of grass stalks about ¼ inch in diameter and about 15 to 18 inches long, and males join them as soon as they have stretched their wings after emerging. Several hundreds of these bundles of grass suspended from a bamboo stretching across a room in a darkened hut, each with its 8 or 10 couples of moths, measuring 7 and 8 inches across, from tips of wings, present, to say the least, a curious spectacle. The males, after some five or six days, drop off, and within a few days die, while the females deposit eggs each to the number of 200 to 300 on the grass stalks and then expire.—So simple is the culti-

vation of this species that with a little more troublegiven to se cure ample food, the crop might be unlimited. Owing to the insoluble nature of the gluten with which the worm binds the filaments on the cocoon, all attempts to *unreel* this thread have proved unsuccessful, and this fine strong silk is only dragged off and spun, like so much jute, only into an uneven thread and is always more or less of a dirty colour due to the dirt gathered in this process. In the plains of Assam, a disease seems to affect the worm, and a very large proportion of cocoons are of a bright fawn colour which is hardly noticeable in the cocoons reared in the villages bordering the valley of the Mopili river in the Khassi and Jynteah Hills. This fawn colour is, however, not permanent, and in the spinning and making with other cocoons is not noticeable.

It is difficult to arrive at a correct estimation of the total quantity produced of this kind of silk, as, probably as much as is exported, is consumed in the Province itself to make *pugrees*, *sarees*, *dhoties*, and very serviceable cold weather bed-coverings. Large quantities of these latter are exported to Calcutta, and of late years, the cocoons have been finding favor in the European markets, where more skilful measures have been devised for obtaining an even thread.—(*Indian Agriculturist.*)

MR. BALFOUR ON FORESTRY IN IRELAND.

In the course of his speech in the House on the subject of the relief of Irish distress, Mr. Balfour said:—At Knockbog it happened that the landlord was ready to sell, and a hillside of 1,000 acres was in the hands of a single tenant, Father Flanagan, who offered to give up his rights in the land for nothing. The land was obtained for 10s. an acre, and I have given directions to start an experiment in forestry. I sent round a number of inquiries to owners in England, Scotland, and Ireland, and the information thus obtained has convinced me that not only in Ireland, but in England and Scotland as well, we are far behind the Continent in this matter of forestry. The sooner we make ourselves acquainted with what they do on the Continent, the sooner we shall be able to turn to account large tracts in Ireland in this country, and in Scotland, which are now little better than waste. Mr. John Morley said that he did not know whether the experiment of planting 1,000 acres was to be the end of the activity of the Government. He admitted what the right hon. gentleman had said about the backwardness of this country in the art of forestry. But the Right Hon. gentleman forgot that within the last three or four years a Committee of the House had made recommendations, and that no steps had been taken to carry them out. He hoped the Minister of Agriculture would pay attention to those recommendations of the Select Committee.—(*Timber Trades Journal.*)

NEW THEORY OF DEW.

A correspondent sends the following interesting note:—"A few months ago a new theory was put forward respecting the origin and nature of the moisture found in the morning, on leaves and grass. It had hitherto been held by all naturalists apparently without exception, that this moisture was dew. But a gentleman in Scotland, not known to fame, was not content to accept the current and traditional opinion; and assuming nothing, he investigated the subject *de novo*, with the result that he was able to prove to demonstration that between the dew and the moisture found after a rainless night on vegetation there was an essential difference. He discovered that while dew is but the mere exhalation of the soil, this moisture was an exudation from the vegetation itself. The theory came as a surprise to the scientific world: but the steps of the demonstration were so clearly worked out that the author of the discovery, though not noted as a man of science, was at once brought into public notice. He was held by the highest scientific authorities to have made a distinct discovery in nature. Now, there are some phenomena not mentioned by him which appear undoubtedly to bear out his theory on the subject, and they may be noted at the present time, because they are patent to the observation of us all at this time of the year. Let a tree overhang a white-washed wall or gateway, and in course of time we shall see that the white-wash is covered with green film. On the time-honoured theory that the moisture on leaves was but the exhalation which had risen from the soil during the previous night, it was impossible to account for the colour of this deposit. Mere water would not have produced the phenomenon. The only adequate theory is that the moisture which fell upon the whitewash was chemically a green composition. The theory is further corroborated from the curious fact, equally near at hand to us all, that after a rainless night *mendhi* that was cut on the previous day and is now entirely without green leaves, is dry, while the *mendhi* which is budding and that which has leaves is saturated with moisture. A servant after such a night will, without hesitation, put an article of clothing to air in the sun on *mendhi* so recently cut, though he would deem it the height of folly to place it on green *mendhi* for that purpose. There were two points which first awakened the attention of the discoverer to the subject: the first was, that moisture was found on the under surface of the leaves as well as on the upper; and the second, that moisture was found on the leaves after nights in which no dew had fallen, phenomena for the presence of which the old-world theory provided no satisfactory explanation."—*Indian Agriculturist.*

VI —EXTRACTS FROM OFFICIAL GAZETTES.

1.—Gazette of India.—

16th October, 1891.—*No.* 1140-*F.*—Mr. G. H. Taylor, Deputy Conservator of Forests, Berar, is transferred to the Central Provinces.

26th October, 1891.—*No.* 1167-*F.*—In supersession of previous Notifications on the subject, and with reference to paragraph 8 (*a*) and Appendix I of the Circular Resolution of this Department,, No. 18-F., dated the 29th July last, the following promotions and other changes have taken place in the class of Conservators of Forests, with effect from the 26th February 1891, and up to date :—

Appointments, and names of Officers holding them.	Province or Circle.	Promotions, &c.
Conservators.		
1*st Grade—Pay Rs.* 1,600 —(4).		
1. Col. W. J. Seaton, R.C.	.....	On furlough since 22nd Feby. 1889
2. Col. J. C. Doveton, R.C.	Southern Circle, Central Provinces ...	On furlough up to 15th September 1891 ; returned to duty 16th idem.
Capt. E. S. Wood ...	.....	Retired 10th May 1891.
3. Lieut.-Col. F. Bailey, R.E. ...	.....	On furlough since 24th March 1890. Promoted from 2nd grade on 26th February 1891.
4. Mr. H. C. Hill ...	.....	On furlough since 18th March 1891. Promoted from 2nd grade on 10th May 1891.
2*nd Grade—Pay Rs.* 1,350 —(5).		
1. Col. G. J. Van-Someren, M. G. L. I. ...	.....	Officiated in 1st grade up to 25th July 1891. On 6 month's special leave since 26th idem.
Mr. G. Mann ...	.....	Officiated in 1st grade up to 30th April 1891. Retired 1st May 1891.
2. Mr. J. S. Gamble ...	School Circle, North-Western Provinces ...	Absorbed from being a supernumerary on 26th February 1891. Officiating in 1st grade since 26th idem.
3. Mr. A. L. Home ...	...	On furlough since 9th October 1890. Promoted from 3rd grade on 26th February 1891.

Appointments, and names of Officers holding them.	Province or Circle.	Promotions, &c.
4. Mr. E. P. Popert ...	.....	On furlough since 9th July 1890. Promoted from 3rd grade on 1st May 1891.
5. Mr. W. R. Fisher ...	.....	On deputation to Cooper's Hill College since 1st November 1890. Promoted from 3rd grade on 10th May 1891.
3rd Grade—Pay Rs. 1,100 —(4).		
1. Mr. C. Bagshawe ...	.....	On furlough since 14th October 1890.
2. Mr. R. H. C. Whittall	.....	Officiated in 2nd grade up to 14th March 1891. On furlough since 15th idem.
3. Mr. E. P. Dansey ...	Bengal ...	Confirmed 1st May 1891. Officiating in 1st grade from 1st idem.
4. Mr. J. W. Oliver ...	Upper Burma...	Confirmed 10th May 1891. Officiating in 1st grade from 10th idem. On 3 months' privilege leave since 6th August 1891.
Major C. T. Bingham	Tenasserim Circle, Burma ...	Officiating from 7th July 1889.
Mr. R. H. E. Thompson	Northern Circle. Central Provinces ...	Officiating from 2nd Septr. 1891. Held charge of Northern and Southern Circles from 26th July to 15th September 1891.
Mr. S. E. Wilmot ...	Oudh ...	Officiating from 11th April 1890.
Mr. P. J. Carter ...	Pegu Circle Burma ...	Officiating from 9th July 1890.
Mr. F. B. Dickinson ...	Berar ...	Officiating from 4th October 1890.
Mr. A. E. Wild ...	Punjab ...	Officiating from 25th March 1891.
Mr. J. T. Jellicoe ...	.....	Officiated from 1st May to 31st August 1891.
Mr. W. Shakespear ...	.....	Officiated from 1st May to 3rd August 1891.
Mr. W. E. D'Arcy ...	Central Circle, North-Western Provinces ...	Officiating from 10th July 1891.
M. J. Nisbet ...	.....	Officiating from 6th August 1891 (*vice* Mr. Oliver.)
Mr. J. McKee ...	Assam ...	Officiating from 1st September 1891.

2.—MADRAS GAZETTE.—

30th October, 1891.—*No.* 1210 *F.*—The services of Mr. E. P. Popert Conservator of Forests, Burma, are, on his return from furlough placed at the disposal of the Government of Madras.

17th October, 1891.—Mr. T. N. Hearsey. Sub-Assistant Conservator of Forests, is transferred to Kurncol, to rejoin at expiration of his leave.

22nd October, 1891.—P. R. Rathnasami Pillai. Forest Ranger, Ganjam, is transferred to Godavari, to rejoin at expiration of his leave.

23rd October, 1891.—*No.* 482.—*Mr. A. B. Jackson, Acting District Forest Officer, Bellary, to act as District Forest Officer, Anantapur.*

No. 483.—M. R. Ry. T. M. Nallasami Naidu Garu, Acting District Forest Officer, Anantapur, to act as District Forest Officer, Bellary.

24th October, 1891.—*No.* 394.—Under section 2 of the Madras Forest Act V of 1882, the Right Honorable the Governor in Council is pleased, in supersession of Notification No. 370 published in the *Fort St. George Gazette* of the 13th instant, to empower M. R. Ry. S. Brahmanandam Nayudu, Acting Taluk Sarishtadar and Third-class Magistrate of Narsaraopet, in the District of Kistna, to try forest offences.

24th October, 1891.—The Board of Revenue (Land Revenue) has granted fifteen days' privilege leave under article 291 of the Civil Service Regulations to Mr. J. S. Battie, District Forest Officer, Ganjam.

27th October, 1891.—*No.*—478.—Mr. T. G. A. Gaudoin, Sub-Assistant Conservator, Second Grade, is appointed to act as District Forest Officer Anantapur, during the absence of T. M. Nallasami Naidu Garu on privilege leave.

3.—BOMBAY GAZETTE.—

3rd October, 1891.—*No.* 3455.—In supersession of the orders contained in Government Notification No. 2886, dated 15th August, 1891, Mr. H. Murray, Deputy Conservator of Forests, Fourth Grade, and Divisional Forest Officer, Belgaum, is allowed privilege leave of absence for three months from 9th October 1891.

3rd October, 1891.—*No.* 6820.—His Excellency the Governor in Council is pleased to appoint Mr. F. Gleadow to act as Divisional Forest Officer, Belgaum, during the absence of Mr H. Murray on privilege leave, or pending further orders. Government Notification, Revenue Department, No. 6334, dated 15th September, 1891, is hereby cancelled.

14th October, 1891.—*No.* 7049—His Excellency the Governor in Council is pleased to appoint Mr. J. H. Clabby to do duty as Assistant Demarcation Officer under the Forest Demarcation Officer, Thana.

Mr. H. Murray, Deputy Conservator of Forests, who was granted three month's privilege leave in Government Resolution No. 3455, dated 3rd October 1891, delivered over charge of the Divisional Forest Officer Belgaum, to Mr. T. R. D. Bell, Assistant Conservator, on the 8th October 1891, after office hours.

Mr. F. Gleadow, Deputy Conservator, received charge of the office from Mr. Bell on the afternoon of the 13th idem.

Mr. R. P. Ryan, Assistant Conservator of Forests, relinquished charge of the Bijapur Divisional Forest Office on the forenoon of the 5th instant, and Mr. G. A. Hight, Deputy Conservator, took over charge of the same, on the afternoon, of the 7th idem.

20th October, 1891.—*No.* 7207.—Mr. W. A. Wallinger, acting Divisional Forest Officer, Panch Mahals, passed with credit an examination in Maráthi according to the Higher Standard on the 14th instant.

4.—BENGAL GAZETTE.

5th October, 1891.—In supersession of the orders contained in the notification of this department, dated the 21st July 1891, two months' examination leave, under the provisions of section 57 of the Forest Department Code, is granted to Mr. F. C. Henvey, Assistant Conservator of Forests, with effect from the 4th September 1891.

8th October, 1891.—The following transfers of officers are ordered :—

Mr. R. Quinnell, Sub-Assistant Conservator of Forests, attached to the Sunderbuns Forest Division, to the charge of the Palamow Forest Division.

Mr. J. C. Mendes, Sub-Assistant Conservator of Forests, in charge of the Palamow Forest Division, on being relieved by Mr. Quinnell, is attached to the Sunderbuns Forest Division.

28th October, 1891.—In modification of the orders contained in the Notification, dated the 6th July, 1891, published at page 767, Part I of the *Calcutta Gazette* of the 12th idem, the following changes are hereby ordered, with effect from the 1st October, 1891 :—

Mr. G. A. Richardson, Officiating Deputy Conservator of Forests, second grade, to revert to his substantive appointment of Deputy Conservator of Forests, third grade.

Mr. E. G. Chester, Deputy Conservator of Forests, third grade, to officiate in the second grade of Deputy Conservator of Forests.

5.—N.-W. PROVINCES AND OUDH GAZETTE.

6th October, 1891.—*No.* 4949.—With effect from the 1st July 1891, to fill an existing vacancy, Mr. A. P. Grenfell, Assistant Conservator of Forests, 2nd grade, to officiate as Assistant Conservator of Forests, 1st grade.

8th October, 1891.—*No.* 5048.—This Department Notification No. 3171, dated 17th July 1891, notifying promotion of certain Forest Officers, *vice* Mr. E. P. Dansey, promoted, is hereby cancelled.

No. 5051.—With effect from the 14th February 1891, the date on which Mr. E. McA. Moir, Deputy Conservator of Forests, 2nd grade, was promoted as Deputy Conservator of Forests, 1st grade—

Mr. E. P. Dansey, Deputy Conservator of Forests, 3rd grade, to be Deputy Conservator of Forests, 2nd grade, but to continue to be on deputation in Bengal as a Conservator of Forests ;

Mr. N. Hearle, Deputy Conservator of Forests, 4th grade, to be Deputy Conservator of Forests, 3rd grade ;

Mr. A. G Hobart-Hampden, Assistant Conservator of Forests, 1st grade, to be Deputy Conservator of Forests, 4th grade, but to continue to officiate as Deputy Conservator of Forests, 3rd grade ;

Mr. M. Hill, Assistant Conservator of Forests, 2nd grade, to be Assistant Conservator of Forests, 1st grade.

No. 5052.—With effect from the 1st May 1891, the date on which Mr. E. P. Dansey was appointed to be Conservator of Forests, 3rd grade, Bengal—

Mr. A. Smythies, Deputy Conservator of Forests, 3rd grade, to be Deputy Conservator of Forests, 2nd grade;

Mr. A. F. Broun, Deputy Conservator of Forests, 4th grade (on deputation), to be Deputy Conservator of Forests, 3rd grade;

Mr. A Campbell, Assistant Conservator of Forests, 1st grade to be Deputy Conservator of Forests, 4th grade, but to continue to officiate as Deputy Conservator of Forests, 3rd grade;

Mr. B. B. Osmaston, Assistant Conservator of Forests, 2nd grade, to be Assistant Conservator of Forests, 1st grade.

6.—PUNJAB GAZETTE.

30th October, 1891.—*No.* 377.—Consequent on Mr. W. E. D'Arcy, Deputy Conservator of Forests, 3rd Grade, and Assistant Inspector-General of Forests, being seconded in the Punjab in accordance with clause 4 of paragraph 7 of Government of India Circular No. 18 F., dated 29th July 1891, the following officiating promotions shall have effect from the 26th of February 1891 :—

1. Mr. J. H. Lace, Deputy Conservator of Forests, 4th Grade, to be Officiating Deputy Conservator of Forests, 3rd Grade.
2. Mr E. R. Murray, Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*, to be Officiating Deputy Conservator of Forests, 4th Grade.

No. 378.—Consequent on the appointment as Officiating Conservator of Forests of Mr. A. E. Wild, Deputy Conservator of Forests, 1st Grade, *vice* Mr. R. H. C. Whittall, proceeded on one year's furlough, the following temporary promotions shall have effect from the 25th of March 1891 :—

1. Mr. F. O. Lemarchand, Deputy Conservator of Forests, 3rd Grade, to be Officiating Deputy Conservator of Forests, 2nd Grade.
2. Mr. L. G. Smith, Deputy Conservator of Forests, 4th Grade, to be Officiating Deputy Conservator of Forests, 3rd Grade.
3. Mr. G. S. Hart, Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*, to be Officiating Deputy Conservator of Forests, 4th Grade.

No. 379.—Consequent on the return from privilege leave of Mr. J. L. Pigot. Deputy Conservator of Forests, 4th Grade, sub. *pro tem.*, the following reversion shall have effect from the 6th of April 1891 :—

1. Mr. G. S. Hart, Officiating Deputy Conservator of Forests, 4th Grade, to be Assistant Conservator of Forests, 1st Grade sub. *pro tem.*

No. 380.—Consequent on the return from deputation in the Patiala State of Mr. G. G. Minniken, Officiating Deputy Conservator

of Forests, 2nd Grade, the following reversions shall have effect from the 21st of April 1891 :—

1. Mr. F. O. Lemarchand, Officiating Deputy Conservator of Forests, 2nd Grade, to be Deputy Conservator of Forests 3rd Grade.
2. Mr. L. G. Smith, Officiating Deputy Conservator of Forests, 3rd Grade, to be Deputy Conservator of Forests, 4th Grade.
3. Mr. A. L. McIntire, Deputy Conservator of Forests, 4th Grade, sub. *pro tem*, to be Officiating Deputy Conservator of Forests, 4th Grade.
4. Mr. E. R. Murray, Officiating Deputy Conservator of Forests, 4th Grade, to be Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*
5. Mr. A. V. Monro, Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*, to be Officiating Assistant Conservator of Forests, 1st Grade.

No. 381.—Consequent on the departure on privilege leave of Mr. A. M. Reuther, Officiating Deputy Conservator of Forests, 3rd Grade, the following temporary promotions shall have effect from the 29th April 1891 :—

1. Mr. L. G. Smith, Deputy Conservator of Forests, 4th Grade, to be Officiating Deputy Conservator of Forests, 3rd Grade.
2. Mr. E. R. Murray, Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*, to be Officiating Conservator of Forests, 4th Grade.
3. Mr. A. V. Monro, Officiating Assistant Conservator of Forests, 1st Grade, to be Assistant Conservator of Forests, 1st Grade, sub. *pro. tem.*

No. 382.—Consequent on deputation of Mr. J. C. McDonell, Deputy Conservator of Forests, 1st Grade to Kashmir, the following Officiating promotions shall have effect from the 11th June 1891.

1. Mr. F. O. Lemarchand, Deputy Conservator of Forests, 3rd Grade, to be Officiating Deputy Conservator of Forests, 2nd Grade.
2. Mr. J. L. Pigot, Deputy Conservator of Forests, 4th Grade, sub. *pro tem.*, to be Officiating Conservator of Forests, 3rd Grade.
3. Mr. G. S. Hart, Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*, to be Officiating Deputy Conservator of Forests, 4th Grade.

No. 383.—Consequent on Mr. J. L. Pigot, Deputy Conservator of Forests, 4th Grade, sub *pro tem.*, and Officiating in the 3rd Grade having been seconded in the Punjab in accordance with clause 4, paragraph 7, of Government of India Circular No. 18 F., dated 29th July 1891, the following Officiating promotions shall have effect from the 10th July 1891 :—

1. Mr. A. L. McIntire, Deputy Conservator of Forests, 4th Grade, Officiating, to be Officiating Deputy Conservator of Forests, 3rd Grade.

2. Mr. A. V. Monro, Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*, to be Officiating Deputy Conservator of Forests, 4th Grade.

No. 384.—Consequent on the return from privilege leave of Mr. A. M. Reuther, Officiating Deputy Conservator of Forests, 3rd Grade, the following reversion shall have effect from the 29th July 1891 :—

1. Mr. A. L. McIntire, Officiating Conservator of Forests, 3rd Grade, to be Officiating Conservator of Forests, 4th Grade.
2. Mr. A. Monro, Officiating Deputy Conservator of Forests, 4th Grade, to be Assistant Conservator of Forests, 1st Grade, sub. *pro tem.*

No. 385.—Consequent on the departure on leave on private affairs of Mr. G. S. Hart, Officiating Deputy Conservator of Forests, 4th Grade, the following temporary promotion shall have effect from the 9th August 1891 ;—

1. A. V. Monro, Assistant Conservator of Forests, 1st Gradee sub. *pro tem.*, to be Officiating Deputy Conservator of Forests, 4th Grade.

7.—CENTRAL PROVINCES GAZETTE.—

8th October, 1891.—*No.* 7125.—The Chief Commissioner is pleased to direct, in accordance with Section 123 of the Central Provinces Land Revenue Act (XVIII of 1881), that the conditions regarding the felling of timber in the Malguzari forests, entered in clause 6 of the record of rights of Mauzah Dighori, in the Bhandara Tahsil, shall be enforced by Government.

6th October, 1891.—No. 62.—Bhya Lal Dube, Forester, 1st grade, No. 10, in the Mandla Forest Division, is appointed to act as a Forest Ranger in the 6th grade, with effect from the 1st September 1891.

No. 7484.—Under Section 124-A of Act XVIII of 1881 as amended by Act XVI of 1889 (the Central Provinces Land Revenue Act), the Chief Commissioner has been pleased to make the following rules for the control and management of Malguzari forest lands, the rules issued with Notification No. 1332, dated the 5th March 1891, being hereby cancelled :—

I.—The following trees growing on Malguzari forest lands shall not be cut without the permission of the Deputy Commissioner :—

Mango, Mahua, Achar, Jamun, Harra and Bahera, and the fruit-bearing Tendu.

II.—Subject to the preceding rule and also subject to the obligation of giving two months' notice to the Deputy Commissioner in the form appended to these rules, Malguzars are at liberty to cut and dispose of, as they please, forest produce growing on culturable land in their mahals, in order to clear the land for cultivation.

Provided that it shall be competent to the Deputy Commissioner, for reasons to be recorded in writing, to prohibit or to restrict such cutting if prohibition or restriction appears to him to be desirable in the interests of the public generally, or of the village community by whom rights of *nistar* are enjoyed under the Wajib-ul-arz or by custom.

III.—The cutting of forest produce growing on culturable land not required for cultivation and the cutting of forest produce growing on unculturable land, that is to say, land which in the judgment of the Deputy Commissioner is to be classed as unculturable—*Bhatua*, *Barra*, *Bardi*, *Bhata* or *Pathar*—shall be limited by the following conditions, in addition to those laid down in Rule I :—

(1) A forest is not to be leased out to a contractor without permission of the Deputy Commissioner.

(2) In cutting timber trees, seed-bearing trees must be left at the rate of not less than 30 per acre of the principal kinds cut ; and the number of trees, of all kinds left growing must not be less than 90 per acre, which number should be equally distributed throughout the area over which the cutting was effected.

(3) In cutting timber and brushwood, the cutting must be effected flush with the ground, so as to encourage re-production by shoots from the stool.

(4) In cutting bamboos, all culms of less than two years' growth must be left in the clump.

(5) The digging up of roots is prohibited except in the case of the *palas*, the roots of which may be dug up for fibre, provided that at least one-third of the roots are left to continue its growth.

(6) No cutting shall, without the permission of the Deputy Commissioner, be effected within a distance of 20 yards (or 40 *haths*) of either bank of a stream or nala in which water ordinarily remains till the month of January.

(7) The ringing of *sal* trees for resin, so as to sever the bark round the entire circumference, is prohibited.

IV.—Any material violation of Rules I, II, and III will render the forest liable to be notified as requiring special protection.

V.—In Malguzari forest areas which are notified by the Deputy Commissioner as requiring special protection, the previous permission of the Deputy Commissioner shall be required to the cutting for sale, or for conveyance or use outside the village area, of all kinds of timber, bamboos and brushwood. The Deputy Commissioner may refuse to grant such permission, or may limit the amount of cutting to be effected under an application, if he considers such refusal or limitation necessary to prevent the deterioration of the forest.

VI.—In Malguzari forest areas which have been notified by the Deputy Commissioner under the preceding rule, the cutting of timber, bamboos or brushwood for domestic consumption (*nistar*) will ordinarily be allowed without express permission, but the Deputy Commissioner may limit such cutting for *nistar* if he considers a limitation for the preservation of the forest.

VII.—Leaves, grass and dead wood may at all times without any permission be removed from a Malguzari forest by people entitled to do so.

VIII.—Any Malgusar or malguzars who may submit through the Deputy Commissioner a special plan for the working of his or their forests, or who may apply to have a working plan made out for him or them and at his or their expense by the Forest Officer, shall, on such plan being approved by the Commissioner, be exempt from the operation of the preceding rules during the currency of such plan and so long as its provisions are observed.

Form of Notice under Rule II.

Name of Malguzar.	Name of forest and village in which it it proposed to cut timber.	Estimated area of forest.	Area which it is proposed to clear for cultivation, with description of soil.	By whom the land when cleared is to be cultivated.	Estimated number of timber trees to be cut, with specification of species of tree.
1	2	3	4	5	6

NOTE.—This notice may be sent to the Deputy Commissioner by registered letter. If the Malguzar receives, within the two months following the notice, no Communication from the Deputy Commissioner under the proviso to Rule II, he may proceed to clear the land and dispose of the timber as he pleases.

8.—BURMA GAZETTE.—

5th October, 1891.—*No.* 225.—Under the provisions of section 4, subsection (2) of the Upper Burma Forest Regulation, 1887, and with reference to this Department Notification No. 139, dated the 30th August 1890, the Chief Commissioner appoints Mr. C. E. Muriel, Deputy Conservator of Forests Chindwin division, to succeed Mr. Slade as the Forest Officer to assist the Forest Settlement Officer in the enquiry referred to in this department Notification No. 161, dated the 23rd November 1888.

7th October, 1891.—*No.* 226.—Under the provisions of section 57 of the Forest Department Code examination leave for one month is granted to Mr. R. F. Lowis, Sub-Assistant Conservator of Forests, with effect from the 1st October 1891.

No. 227.—The following transfers are ordered :—

Mr. F. J. Branthwaite, Assistant Conservator of Forests, on being relieved by Mr. Thellusson from Thayetmyo to Rangoon as Personal Assistant to the Conservator of Forests, Pegu Circle ;

Mr. G. R. Long, Assistant Conservator of Forests, from Rangoon to the Toungoo forest division ;

Mr. E. A. O'Bryen, Conservator of Forests, from the Toungoo to the Pyinmana forest division.

5th October, 1891.—*No.* 10.—Mr. F. J. Branthwaite, Officiating Deputy Conservator of Forests, assumed charge of the Thayetmyo division on the forenoon of the 2nd instant.

12th October, 1891.—*No* 11.—With reference to Revenue Department Notification No. 227 F, dated the 7th instant, Mr. G. R. Long, Assistant Conservator of Forests, made over, and Mr. F. J. Branth-

waite, Officiating Deputy Conservator of Forests assumed charge of the duties of Personal Assistant to the Conservator of Forests, Pegu Circle, on the forenoon of the 7th October 1891.

15th October, 1891.—*No.* 246.—Mr. W. T. T. MacHarg, Assistant Conservator of Forests, is posted to the charge of the Agency Forest division, Tenasserim Circle, and is appointed to be Sub-divisional Officer of the Kado Forest sub-division in addition to his other duties.

No. 247.—The Chief Commissioner is pleased to direct that the head-quarters of the West Salween Forest division shall from the 1st November to the 31st May be Papun and from the 1st June to the 31st October, Moulmein.

No. 248.—Under the provisions of section 4, sub-section (2) of the Upper Burma Forest Regulation, 1887, and in supersession of his Department Notification No. 66, dated the 2nd April 1891, the Chief Commmissioner appoints Mr. C. E. Muriel, Deputy Conservator of Forests, Chindwin division, to be the Forest Officer to assist the Forest Settlement Officer in the enquiry prescribed by Chapter II of the Regulation in respect of the forest described in this Department Notification No. 10 (Forests), dated the 8th January 1891.

No. 249.—Under the provisions of section 4, sub-section (2) of the Upper Burma Forest Regulation, 1887, and in supersession of this Department Notification No. 67, dated the 2nd April 1891, the Chief Commissioner appoints Mr. C. E. Muriel, Deputy Conservator of Forests, Chindwin division, to be the Forest Officer to assist the Forest Settlement Officer in the enquiry prescribed by Chapter II of the Regulation in respect of the forest described in this Department Notification No. II (Forests), dated the 8th January, 1891.

2.—ASSAM GAZETTE.—

8th October, 1891.—*No.* 8598 *G.*—Mr. J. T. Jellicoe, Deputy Conservator of Forests, received charge of the Darrang Forest Division from Mr. W. F. Lloyd, Assistant Conservator of Forests, on the afternoon of the 30th September 1891.

No 8599 *G.*—Mr. W. F. Lloyd, Assistant Conservator of Forests, received charge of the Working Plans Division from Mr. J. McKee, Officiating Conservator of Forests, on the afternoon of the 5th October 1891.